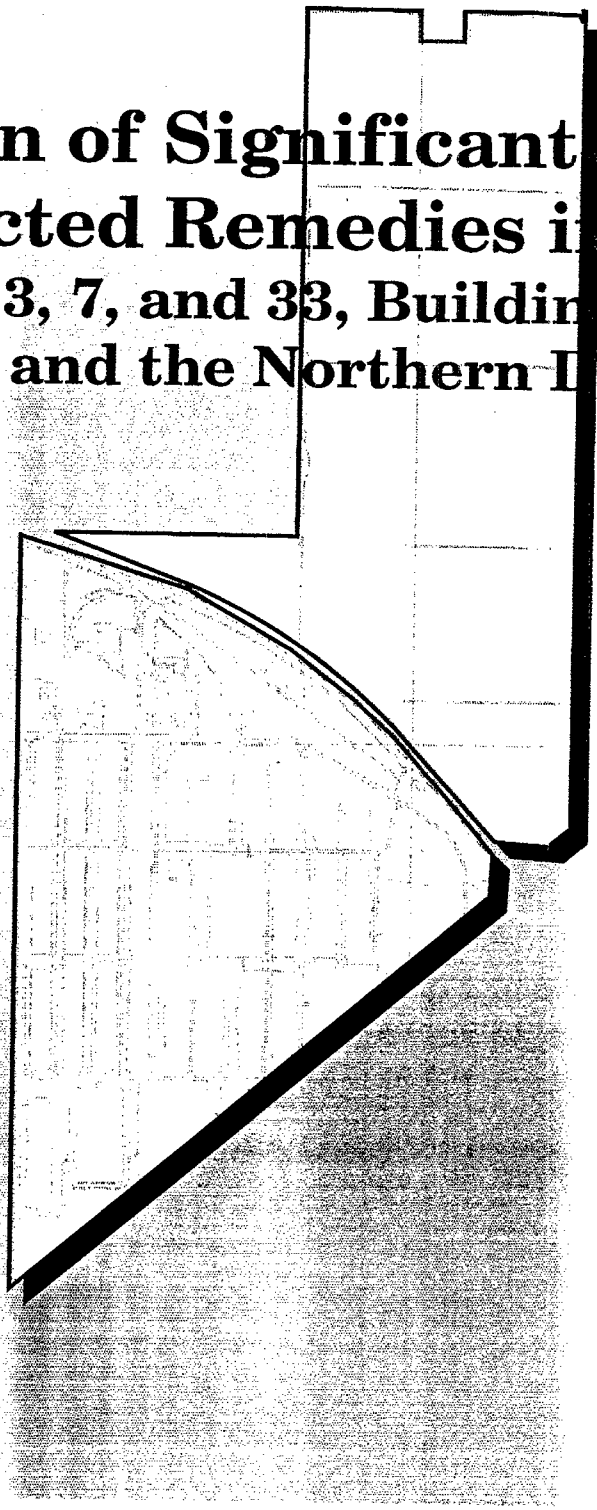
Defense Distribution Depot San Joaquin California
Tracy Site, Tracy, California

Explanation of Significant Differences to the Selected Remedies in the ROD for SWMUs 2, 3, 7, and 33, Building 30 Drum Storage Area, and the Northern Depot Soils Area



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July 2001

U.S. Army Corps of Engineers
Engineering and Support Center, Huntsville

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U.S. Environmental Protection Agency
Region IX
ATTN: Michael Work (H-9-1)
75 Hawthorne Street
San Francisco, CA 94105-3901

SUBJECT: Submission of Covers and Slip Pages, Final DDJC-Tracy Explanation of Significant Differences to the Selected Remedies in the ROD

Dear Mr. Work:

Enclosed for your review are cover slip pages for the final *DDJC-Tracy Explanation of Significant Differences to the Selected Remedies in the ROD*. This final document will be included in the Administrative Record, and a Public Notification will be submitted stating its availability for review by the general public.

If you have any questions or comments regarding this report, please call me at (916) 679-2069 or Jeff Herrin at (916) 679-2084.

Sincerely,

Graham D. Sharpe, P.E.
Program Manager

GDS/js

Enclosure

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DEFENSE DISTRIBUTION DEPOT SAN JOAQUIN CALIFORNIA, TRACY SITE
TRACY, CALIFORNIA

EXPLANATION OF SIGNIFICANT DIFFERENCES TO THE SELECTED REMEDIES IN THE ROD FOR SWMUS 2, 3, 7, AND 33, BUILDING 30 DRUM STORAGE AREA, AND THE NORTHERN DEPOT SOILS AREA

FINAL

Prepared for:

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July 2001

FINAL

DDJC-TRACY

EXPLANATION OF SIGNIFICANT DIFFERENCES TO THE SELECTED REMEDIES IN THE ROD FOR SWMUs 2, 3, 7, AND 33, BUILDING 30 DRUM STORAGE AREA, AND THE NORTHERN DEPOT SOILS AREA

July 2001

This report was prepared by the staff of URS under excellent technical supervision. Interpretations, conclusions, and recommendations in the report are based upon high quality data and information obtained from previous investigations and DDJC-Tracy files. I concur with the data interpretation, conclusions, and recommendations presented in this report.

Thomas F. Cudzilo, Ph.D.
Registered Geologist 4473

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LIST OF ACRONYMS AND ABBREVIATIONS

ARARs	Applicable or Relevant and Appropriate Requirements
AWQC	ambient water quality criteria
BAF	bioaccumulation factor
CEHNC	U.S. Army Corps of Engineers, Huntsville Center
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESPK	U.S. Army Corps of Engineers, Sacramento District
CFR	Code of Federal Regulations
COCs	chemicals of concern
CVRWQCB	Central Valley Regional Water Quality Control Board
DDJC-Tracy	Defense Distribution Depot San Joaquin, Tracy Site
DLA	Defense Logistics Agency
DTSC	Department of Toxic Substances Control
ECC	Environmental Chemical Corporation
ESD	Explanation of Significant Differences
FFA	Federal Facilities Agreement
IWPL	Industrial Waste Pipe Line
mg/kg	milligrams per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SARA	Superfund Amendmenet and Reauthorization Act
SWMU	Solid Waste Management Unit
U.S. EPA	U.S. Environmental Protection Agency
µg/kg	micrograms per kilogram

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

ES.1 This Explanation of Significant Differences (ESD) presents the changes to be made to the Site-Wide Comprehensive Record of Decision (ROD) for Defense Distribution Depot San Joaquin, Tracy Site (DDJC-Tracy).

SWMU 4

ES.2 Excavation and disposal of sediment is being deleted from the selected remedy for the Storm Water Detention Pond (Solid Waste Management Unit [SWMU] 4). Table ES-1 gives a summary of the components of the selected remedy and the changes being made to it. The revised remedy includes construction of a weir to prevent the discharge of sediment in storm water. Discharge from the Storm Water Detention Pond will be monitored for compliance with Ambient Water Quality Criteria (AWQC). Construction of a sediment trap is being deferred to determine if compliance can be achieved with the weir. The sediment trap will be constructed at a later date if necessary to achieve compliance. Groundwater monitoring is still required to evaluate the effectiveness of the selected remedy.

ES.3 An ecological risk assessment was performed and preliminary risk-based cleanup standards were developed for SWMU 4 (Montgomery Watson, 1996a). As noted in the ROD, these cleanup standards were developed using literature values rather than site-specific factors. The ROD indicated that additional data would be collected to obtain site-specific exposure factors and any changes would be made in an explanation of significant differences to the ROD. Soil and sediment samples were collected from SWMU 4 to gather site-specific data. The results of the sampling were used to refine the ROD cleanup standards into site-specific ones.

ES.4 Lead, selenium, and total DDX (combined DDD, DDE, and DDT) were identified as chemicals that impacted ecological receptors at SWMU 4. Additional samples collected in 1998 were used to verify the previous results for selenium and to refine the site-specific cleanup standards for SWMU 4. Because of the revision to the cleanup standard, excavation can be deleted from the remedy for SWMU 4. See Section 2.4 for a detailed explanation of the calculations and factors that led to this conclusion. Table ES-2 lists the chemicals of concern and their respective cleanup standards for SWMU 4.

SWMUs 2 and 3

ES.5 Excavation and disposal of contaminated soil was performed during the removal action at SWMUs 2 and 3. The components of the selected remedy are unchanged for SWMUs 2 and 3. Only the cleanup standards are modified. The modified cleanup standards reduce the extent of the required excavation.

ES.6 Lead, selenium, and total DDX were also identified as chemicals that impacted ecological receptors at SWMUs 2 and 3. Confirmation samples collected during the removal action were used along with new site-specific exposure factors to review and refine the site-specific cleanup standards for SWMUs 2 and 3. See Section 3.5 for a detailed explanation of the calculations and factors that led to this revision. Table ES-3 lists the chemicals of concern and their respective cleanup standards for SWMUs 2 and 3.

NORTHERN DEPOT SOILS AREA

ES.7 The soil in the Northern Depot Area at DDJC-Tracy requires remediation to address unacceptable risks to human health. However, the units for the arsenic and manganese concentrations in Table 8-14 of *Final Comprehensive Remedial Investigation/ Feasibility Study* (RI/FS) (Montgomery Watson, 1996b) and in the table following paragraph 9.7.9.3 of the ROD (Radian International, 1998a) were incorrect. Corrected cleanup standards were obtained by dividing the exposure point concentration by the total hazard quotient.

ES.8 For arsenic, the cleanup standard is calculated as:

$$62 \text{ mg/kg} \div 1.3 = 48 \text{ mg/kg}$$

ES.9 For manganese, the cleanup standard is calculated as:

$$2.6 \times 10^4 \text{ mg/kg} \div 32 = 812.5 \text{ mg/kg}$$

ES.10 On the basis of this review, the cleanup standards for arsenic and manganese in soil for the Northern Depot Soils Area for DDJC-Tracy are corrected as indicated in Table ES-4.

ES.11 See Section 4.3 for a more detailed explanation of these cleanup standards and how they were derived.

ES.12 The selected remedy is not affected by this correction. An asphalt cover consistent with the dimensions of the cover presented in the ROD is still required for the site. An annual inspection of the cover will be performed to ensure that the asphalt remains intact.

INSTITUTIONAL CONTROLS

ES.13 The ROD requires institutional controls at SWMUs 7 and 33 and the Building 30 Drum Storage Area. The ESD identifies the specific institutional controls that will be implemented at each site. The ESD also requires and defines institutional controls for the Northern Depot Soils Area.

Table ES-1. Modifications to Selected Remedies

Modification of Selected Remedy for SWMU 4

Remedy Component	Revised Remedy
Cleanup Standards	Revised
Excavation of sediment	**Deleted**
Disposal of sediment	**Deleted**
Construction of overflow weir	Required
Construction of sediment trap	**Delayed pending evaluation of ability of overflow weir to retain sediment**
Evaluation of sediment impacts to ambient water quality criteria	Required
Groundwater monitoring	Required

Modification of Selected Remedy for SWMUs 2 and 3

Remedy Component	Revised Remedy
Cleanup Standards	Revised
Excavation of sediment	Required
Disposal of sediment	Required
Confirmation Sampling	Required
Groundwater monitoring	Required

Modification of Selected Remedy for Northern Depot Soils Area

Remedy Component	Revised Remedy
Cleanup Standards	Revised
Installation of asphalt cover	Required
Institutional controls to ensure cover remains intact • **Annual inspection of asphalt cap** • **Revision of Future Use Development Plan to restrict land use**	**Added**

*Note: Changes to selected remedies are shown in bold.

Table ES-2. Site-Specific Cleanup Standards at SWMU 4

	Cleanup Standard in ROD (mg/kg)[a]	Revised Cleanup Standard (mg/kg)	Average Concentration in Sediment at SWMU 4 (mg/kg)	Revised Cleanup Standard Met (yes/no)?
Total DDX	0.24	0.75	0.74	Yes
Lead	5.13	136	74	Yes
Selenium	0.62	NA	0.48	Yes

mg/kg = milligrams per kilogram
NA = not applicable
ROD = Record of Decision
SWMU = Solid Waste Management Unit
[a] Based on most sensitive species.

Table ES-3. Site-Specific Cleanup Standards at SWMUs 2 and 3

	Cleanup Standard in ROD (mg/kg)[a]	Revised Cleanup Standard (mg/kg)	Average Concentration in Soil at SWMUs 2 and 3 (mg/kg)	Revised Cleanup Standards Met (yes/no)?
Total DDX	0.24	2.8	0.51	Yes
Lead	28.3	NA	6.0	Yes
Selenium	0.62	NA	<0.2	Yes

mg/kg = milligrams per kilogram
NA = not applicable
ND = not detected
ROD = Record of Decision
SWMU = Solid Waste Management Unit
[a] Based on most sensitive species.

Table ES-4. Revised Cleanup Standards for the Northern Depot Soils Area

Analyte	Revised Cleanup Standard (mg/kg)
Arsenic	48
Manganese	812

mg/kg = milligrams per kilogram

SECTION 1.0

1.0 INTRODUCTION

1.1 Background

1.1.1 In April 1998, the Final Site-Wide Comprehensive Record of Decision (ROD) for Defense Distribution Depot San Joaquin, Tracy Site (DDJC-Tracy) was signed. This Explanation of Significant Differences (ESD) describes changes to the selected remedies for Solid Waste Management Units (SWMUs) 2, 3, and 4 and the Northern Depot Soils Area. It also defines the specific institutional controls required by the ROD for SWMUs 7, 33, and the Building 30 Drum Storage Area. Also, new institutional control requirements are identified for the Northern Depot Soils Area.

1.1.2 An ESD is required under Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendment and Reauthorization Act (SARA) of 1986, and pursuant to 40 Code of Federal Regulations (CFR) Section 300.435(c)(2)(i). The ESD is an appropriate mechanism for significant, but not fundamental, changes made to the remedial action plan defined in the ROD. This ESD includes information developed during the remedial design process that supports the proposed change.

1.1.3 The lead agency for this ESD is the Defense Logistics Agency (DLA). This ESD provides a brief background on the affected sites, a summary of the remedy selected in the ROD for each site, a description of how the noted changes affect the remedy described in the ROD, and an explanation of why DDJC-Tracy is making the change to the selected remedy. This document is designed to (1) provide the public with an explanation of the changes made to the remedy as described in the ROD, (2) summarize the information that led to the change, and (3) affirm that the revised remedy complies with the statutory requirements of CERCLA Section 121.

1.1.4 The U.S. Environmental Protection Agency (U.S. EPA), the Central Valley Regional Water Quality Control Board (CVRWQCB), and the Department of Toxic Substances Control (DTSC) will provide comments on this ESD. Both comments and responses will be presented in this ESD and will be included in the DDJC-Tracy administrative record. Pursuant to 40 CFR Section 300.435(c)(2)(i), a public comment period is not required for an ESD. However, the ESD is required to be made public by placing it in the administrative record file and information repository. In addition, pursuant to CERCLA Section 117(c) a notice of availability and brief description of the ESD is required to be published in a local newspaper of general circulation.

1.2 Site Description

DDJC-Tracy is primarily a storage and distribution facility for various supplies common to U.S. military services in the western United States and throughout the Pacific. DDJC-Tracy is in an unincorporated area of San Joaquin County 1.5 miles southeast of Tracy, California, approximately 20 miles southwest of Stockton, California, and 60 miles east of San Francisco, California (Figure 1-1). The operating portion of the depot covers a 448-acre triangular parcel; the recently added Tracy Annex consists of 460 acres of agricultural land north of the operating portion of the depot.

1.3 Site Background

1.3.1 In 1991, DDJC-Tracy was listed as a Superfund Site on the National Priorities List (NPL) under CERCLA. On 27 June 1991, DDJC-Tracy, U.S. EPA Region IX, and DTSC signed a Federal Facilities Agreement (FFA) for DDJC-Tracy to ensure that environmental impacts from past and current operations are thoroughly investigated and that appropriate cleanup actions are taken to protect human health, welfare, and the environment. The U.S. EPA, DTSC, and CVRWQCB provide regulatory oversight, technical support, review, and comment on all investigative and cleanup work at DDJC-Tracy.

1.3.2 In April 1998, a Site-Wide Comprehensive ROD (Radian, 1998a) for the DDJC-Tracy site was signed by the U.S. EPA, DTSC, and the CVRWQCB. The ROD

provides the remedial actions selected for groundwater and the SWMUs. The ROD was developed in accordance with CERCLA, as amended by SARA. The remedies selected in the ROD are also in compliance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300) and Chapter 6.8 of the California Health and Safety Code (Section 25300 *et seq.*). Further, these actions are being taken in response to the California Water Code (Section 13300 *et seq.*). The selection of remedies was based on the administrative record for this site.

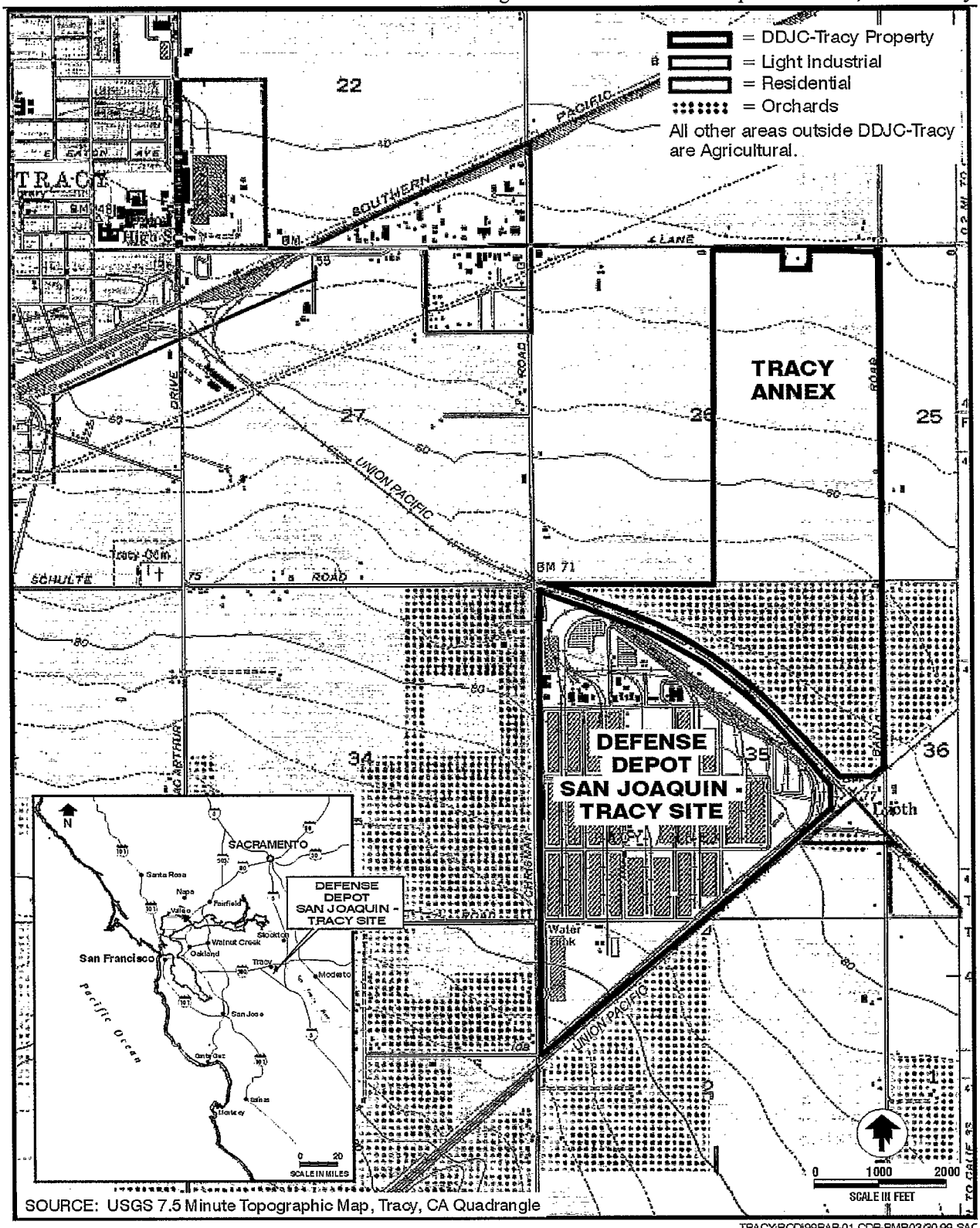
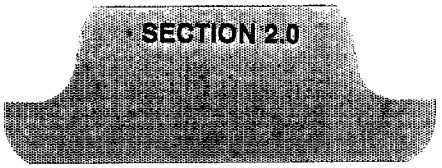


Figure 1-1.
Site Location Map
Defense Distribution Depot San Joaquin - Tracy


SECTION 2.0

2.0 SWMU 4

2.1 Site Description

2.1.1 SWMU 4 is an unlined storm water detention pond located at the northern tip of the DDJC-Tracy site (Figure 2-1). Storm water has been discharged to the detention pond since 1971 through a network of underground storm drains and open surface drainage ditches. The detention pond is bounded by earthen berms approximately 12 feet high and collects runoff through inlets in the southern and eastern portion of the pond. The pond reportedly received rinse water from former paint-stripping, degreasing, and steam-cleaning operations. Selenium, lead, DDT, DDE, and DDD have been found in the pond sediment and were identified as chemicals of concern (COCs) in the ROD. The site attracts waterfowl that inhabit the area.

2.1.2 Some of the water in the pond may be drained during the wet season if the pond is more than half full. During the summer, the water in the pond percolates/evaporates, and most or all of the pond usually dries up. The pond sediment has been scraped at least once over the past 20 years.

2.2 Selected Remedy in the ROD

2.2.1 Limited excavation and disposal constituted the selected remedy for SWMU 4 in the ROD. Lead, selenium, DDD, DDE, and DDT have been detected in the pond sediment and subsurface soil. These constituents pose a threat to ecological receptors. The risk to human health is not considered significant under either the depot worker or the construction worker scenario. Furthermore, paragraphs 9.7.1.9 and 9.7.1.10 of the ROD indicate that cleanup standards to protect groundwater quality were not warranted at SWMU 4 (Radian International, 1998a). Appendix A contains information about constituents detected in surface water and groundwater samples at SWMU 4 (Figure A-1), analytes detected in soil at depth at SWMU 4 (Figure A-2), and organic constituents and metals in soil and sediment at SWMU 4 (Figure A-3).

2.2.2 Sediment cleanup standards in the ROD for SWMU 4 were developed from screening-level ecological assessment results and Applicable or Relevant and Appropriate Requirements (ARARs) (see Appendix D of the ROD). The cleanup standards presented in the ROD are:

Analyte	ROD Cleanup Standard (mg/kg)
Total DDX	0.241
Lead	5.13
Selenium	0.616

mg/kg = milligrams per kilogram
DDX = The sum of DDD, DDE, and DDT

2.2.3 Cleanup standards for total DDX, lead, and selenium are ecological-risk-based concentrations (see paragraph 6.6.5.4 of the ROD), but were estimated using literature values rather than site-specific bioaccumulation factors. Paragraph 9.7.1.12 of the ROD acknowledges that the data available to develop cleanup standards were limited at the time of the ROD and that additional data would be collected to obtain site-specific bioaccumulation factors. The ROD states that "cleanup standards and the extent of excavation will be evaluated and revised as jointly determined by DDJC-Tracy and the agencies. Any modification of the cleanup standards will be made through an explanation of significant differences to this ROD."

2.3 Results of Biota Evaluation

2.3.1 A food web assessment was performed at SWMU 4 in May 1998 to better determine which biota were most appropriate for sampling (Jones & Stokes, 1998a). The assessment concluded that SWMU 4 offers the following types of habitat:

- Open water;

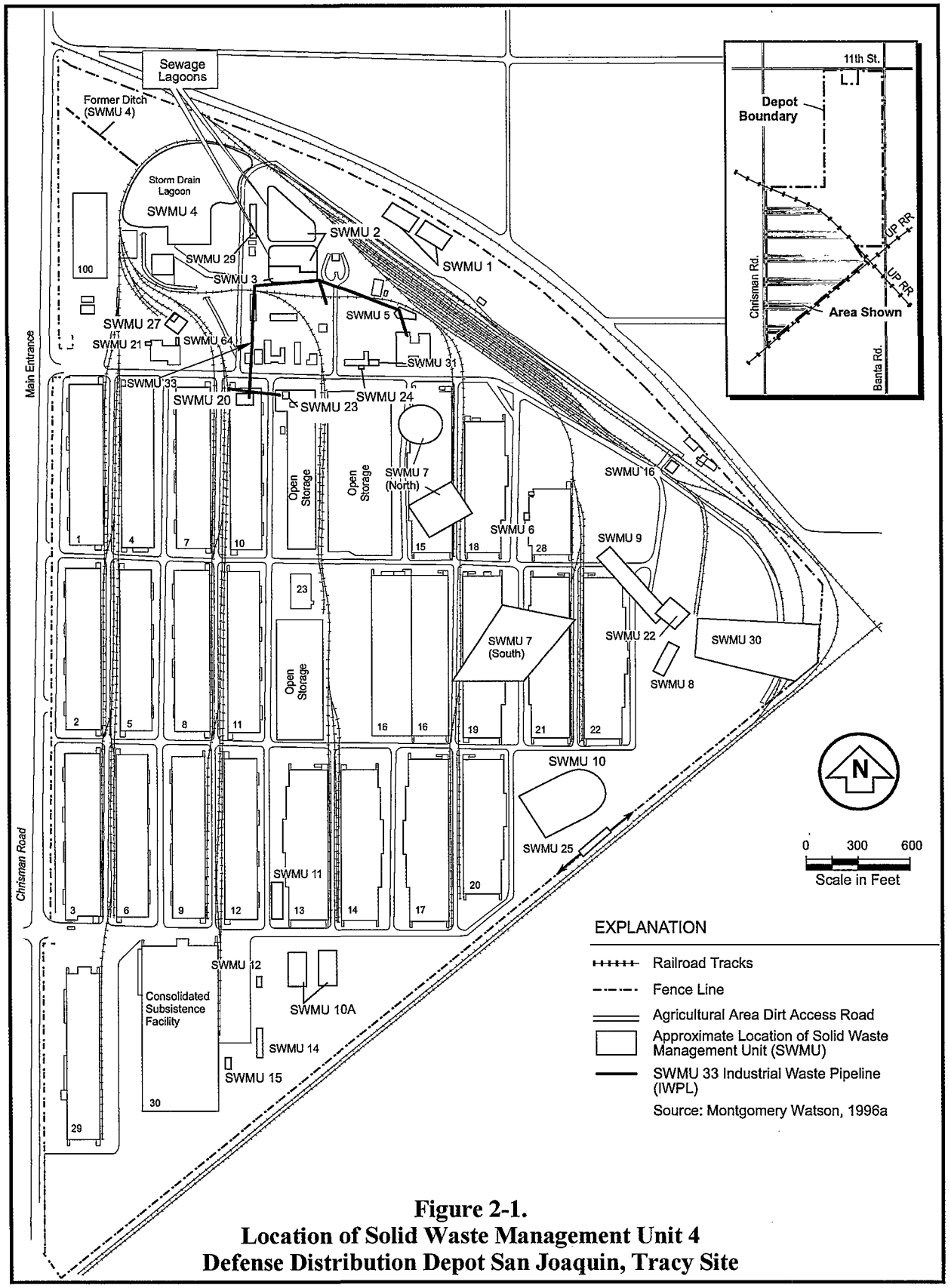


Figure 2-1.
Location of Solid Waste Management Unit 4
Defense Distribution Depot San Joaquin, Tracy Site

- Mixed ruderal vegetation (i.e., growing where the natural vegetational cover has been disturbed by humans) around the pond perimeter; and

- Horticulture planting (oleanders around the southwestern portion of the pond).

2.3.2 Aquatic invertebrates (the chironomid midge, the copepod, and the water boatman) are present in the pond. The green sunfish was the only fish species noted in the pond (Jones & Stokes, 1998a). Several plant and bird species were noted around the pond, as were a limited number of animals (e.g., coyotes, foxes, skunks, raccoons, and opossums).

2.3.3 The results of the food web assessment served as a basis for subsequent sampling of the pond. Samples of surface water, sediment, fish, and invertebrates were collected from SWMU 4 using the methodology presented in *Work Plan for Sampling Biota from Solid Waste Management Unit 4* (Radian, 1998b). Sampling occurred in July 1998. The sampling locations are shown in Figure 2-2. The surface water and sediment samples were sent to Caltest Analytical Laboratory; the invertebrate and fish samples were sent to GP Environmental Laboratory. All samples were analyzed for DDD, DDE, DDT, lead, and selenium.

2.3.4 The depth of the pond had dropped by several feet during June and July 1998. At the time of the sampling on 23 July 1998 the pond had been reduced to a few small pools of water that were 6 to 24 inches deep. For this reason, only a limited number of samples could be taken, and insufficient invertebrates were available for metals analysis. A second set of samples was obtained on 28 July 1998, but the lab reported that there were again too few invertebrates to perform a valid lead and selenium analysis. The analytical results obtained during the sampling event for the surface water, sediment, fish, and invertebrates are reported in *Evaluation of Biota Sampling for Solid Waste Management Units 2, 3, and 4* (Radian, 1999a).

2.4 Modified Cleanup Standards

2.4.1 The purpose of the July 1998 sampling was to develop site-specific cleanup levels to replace the literature-derived standards in the ROD.

2.4.2 The results of the sediment analyses for SWMU 4 indicate that the average levels found in the July 1998 investigation for DDX (0.94 mg/kg) and lead (47 mg/kg) (Radian, 1999a) exceed their respective cleanup levels developed for the ROD (i.e., 0.241 mg/kg for DDX and 5.13 mg/kg for lead) for the most sensitive species. The same holds true for a comparison with the average concentrations for DDX (0.67 mg/kg) and lead (83.7 mg/kg) reported in the RI/FS (Montgomery Watson, 1996b).

2.4.3 Selenium was not detected in the July 1998 sampling event. Selenium was identified as a COC in the ROD; however, it was noted that the selenium results could be biased high (see Paragraph 9.2.3.3.8 of the RI/FS, Montgomery Watson, 1996b). Selenium levels in all 1998 samples were non-detect (Radian, 1999a).

2.4.4 Perhaps the most important site-specific exposure factor is the invertebrate bioaccumulation factor (BAF). The literature-based BAF for DDX, the one used to calculate ROD cleanup standards, is 1.5. A site-specific BAF, calculated by dividing the average concentration of total DDX in invertebrates (0.12 mg/kg) by the average concentration in sediment in this study (0.94 mg/kg), results in a value of 0.13.

2.4.5 The cleanup standards for the mallard and the Great Blue Heron were recalculated using the site-specific BAF. The mallard was substituted for the killdeer in this analysis because it was agreed that ducks were more commonly feeding at the pond. The estimated hazard quotient (HQ) for DDX at SWMU 4 is 1.2 for the Great Blue Heron and 0.08 for the mallard. A revised cleanup standard of 0.75

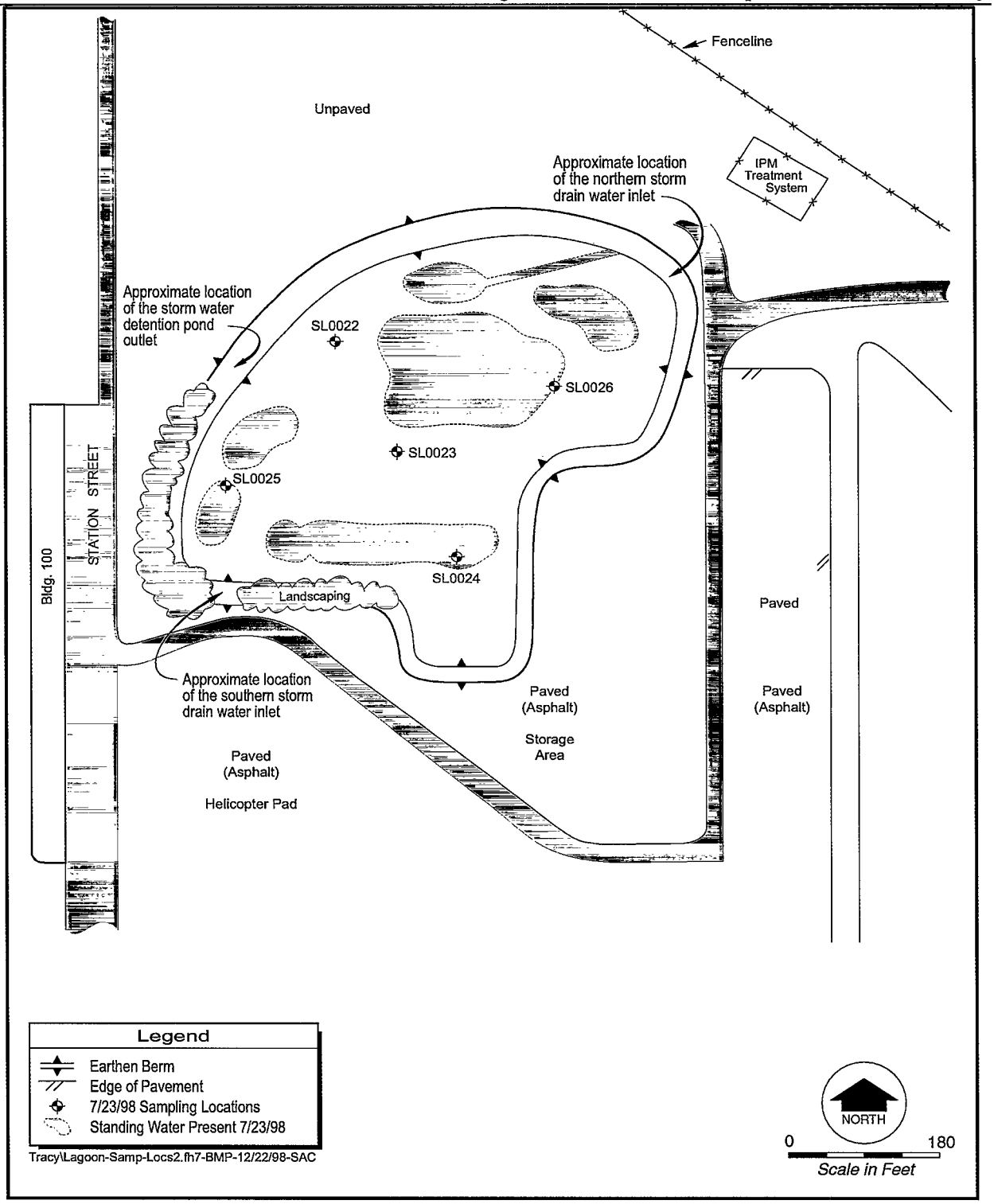


Figure 2-2.

SWMU 4 Sample Locations (23 July 1998)
Defense Distribution Depot San Joaquin, Tracy Site

mg/kg is identified as being protective of the most sensitive species (Great Blue Heron).

2.4.6 The average concentration of lead in sediment using all available data is 74 mg/kg, which is higher than the ROD cleanup standard of 5.13 mg/kg. This cleanup level is based on the Great Blue Heron and assumes that the percentage of diet obtained from the pond is 50%. It is also based on an assumed fish BAF of 0.3 (Radian, 1998a).

2.4.7 Because it is likely that the ecological risk calculations in the ROD overestimated the percentage of pisciverous birds at SWMU 4, the conservative assumptions for the initial analysis were reassessed. Although the habitat at SWMU 4 is viable, it is not highly valuable due, in part, to its relatively small size and isolated location. The agricultural, industrial, and suburban development surrounding SWMU 4 acts as a barrier to many wildlife species and limits the use of the pond by birds for feeding. Estimates of the use of the pond for feeding are as follows (Jones & Stokes, 1998b):

- Tern – less than 1% to 3%. Use of pond for less than 1% of diet is most likely because the tern is migratory. The 3% figure reflects an individual that stays at the pond for an above average amount of time.

- Great Blue Heron and Egrets – less than 1% to 5%. The less-than-1% estimate is used because there is no evidence that these large birds feed at the pond regularly. The 5% estimate is used because if there were a suitable roost or nesting colony in the region, individuals might forage at the pond regularly.

- Green-Backed Heron – less than 1% to 10%. The less-than-1% estimate is used because the heron observed may have only been passing through. The 10% estimate is used because the Green-Backed Heron is a relatively small bird that is more likely than larger birds to find cover at the pond or in the vicinity; therefore, these herons might forage at the pond more frequently.

2.4.8 Previous calculations assumed that the pond contributed 50% of the diet for pisciverous birds. However, a figure of 10% is more appropriate given the site-specific information presented above.

2.4.9 A site-specific BAF was developed for lead in fish (calculated by dividing the maximum lead concentration in fish in the July 1998 study [0.56 mg/kg, see Radian, 1999a] by the average sediment concentration of lead in the July 1998 study [47 mg/kg], for a result of 0.01).

2.4.10 The cleanup standards were recalculated using a site-specific BAF for the Great Blue Heron. It was necessary to use literature data for the mallard because invertebrate data were unavailable. The estimated HQ for lead at SWMU 4 is 1.2 for the heron and 1.1 for the mallard. A modified cleanup standard of 136 mg/kg is recommended as protective of the most sensitive species (Table 2-1).

2.4.11 Furthermore, it should be noted that the allowable concentration of lead in fish used as a basis for the lead cleanup calculations for sediment is 1.54 mg/kg (Radian, 1998a). The highest detected lead concentration in fish was 0.56 mg/kg (Radian, 1999a), about a third of the allowable level.

2.5 Modifications to the Selected Remedy

2.5.1 The selected remedy (limited excavation and disposal) in the ROD consisted of dewatering the Storm Water Detention Pond, constructing a sediment trap at the northern inlet and an overflow weir for discharge to surface water, excavating sediment contaminated with pesticides and selenium, and transporting the sediment to a disposal facility (Class II municipal facility). The ROD also required an evaluation to determine if the discharge concentrations from the pond exceeded ambient water quality criteria (AWQC) because of the concentrations of contaminants in the sediment.

Table 2-1. Modified Cleanup Standards for SWMU 4

	ROD Cleanup Standard (mg/kg)[a]	Samples	Hits[b]	Mean (mg/kg)	Maximum (mg/kg)	Estimated HQ	Revised Cleanup Standards (mg/kg) HQ = 1	Revised Cleanup Standards (mg/kg) HQ = 10[d]
Total DDX	0.241	19	16	0.74	2.3			
Heron						1.2	0.08	0.75
Mallard						0.08	1.3	13.6
Lead	5.13	19	18	74	193			
Heron						1.2	15.4	154
Mallard						1.1	13.6	136
Selenium	0.616	19	0/5[c]	NA	NA	NA	NA	NA

[a] Based on most sensitive species.
[b] Analytical detections.
[c] Hits in the remedial investigation/feasibility study were suspect (Montgomery-Watson, 1996b). Selenium was not detected in recent sampling event (five samples total).
[d] Recommended cleanup standard.

Note: Evaluation results are a combination of the July 1998 sampling results and the sampling results from the remedial investigation/feasibility study (Montgomery-Watson, 1996b).

DDX = sum of DDD, DDE, and DDT concentrations
HQ = hazard quotient
NA = not applicable
SWMU = Solid Waste Management Unit

2.5.2 Portions of the selected remedy were based on the ROD cleanup standards, which were estimated using literature values. The site-specific data that were gathered in July 1998 are more representative of the actual conditions at the site.

2.5.3 The revised cleanup standards (Table 2-2) indicate that the selected remedy for SWMU 4 should be modified as indicated in Table 2-3.

2.5.4 Changes include deleting excavation and disposal of sediment from the Storm Water Detention Pond. The revised selected remedy still requires the construction of an overflow weir to prevent sediment from being discharged in the storm water. The immediate construction of a sediment trap will be deferred pending an evaluation of the ability of the weir to retain sediment.

2.5.5 As part of the selected remedy, an evaluation of the impact of sediment on water quality will be performed. After construction of the weir in the Storm Water Detention Pond, discharges from the pond will be monitored to document compliance with fresh water chronic AWQCs (Radian, 1999b). Samples for monitoring compliance with the AWQCs will be collected from the discharge chamber of the pump station that discharges water from the Storm Water Detention Pond into the irrigation district channel. The location of the pump station is shown on Figure 2-3.

2.5.6 Sampling will be conducted during at least two discharge events per year for the next three years. If the results of this monitoring indicate that discharges from the Storm Water Detention Pond do not comply with the AWQC, additional remedial actions will be developed.

2.5.7 Groundwater monitoring will be performed to monitor the possible migration of contaminants to the groundwater.

2.5.8 The changes to the selected remedy do not reduce its protectiveness of human health and the environment. The additional data collected in the design process were used to refine the risk calculations for ecological receptors. The modified cleanup standards are consistent with the requirements for protecting ecological receptors that were determined in the ROD. The modified cleanup standards were compared with the site data, and it was determined that no excavation would be required to achieve an acceptable level of risk. The modified remedy is as effective as the remedy selected in the ROD. In addition, the modified remedy is both more implementable and has a lower cost than the remedy presented in the ROD.

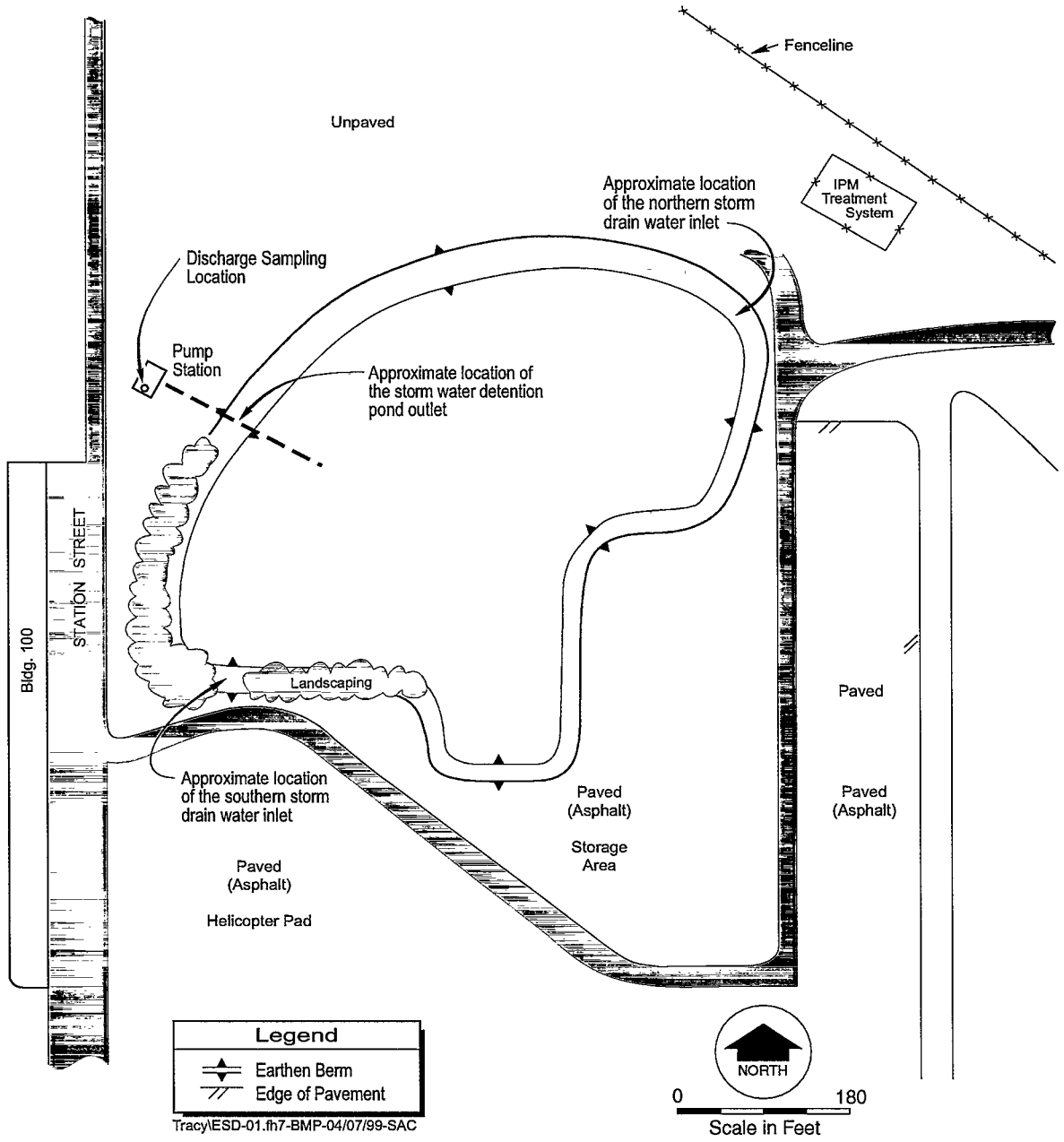


Figure 2-3.

Location of Pump Station – SWMU 4
Defense Distribution Depot San Joaquin - Tracy

Table 2-2. Modified Site-Specific Cleanup Standards at SWMU 4

	Cleanup Standard in ROD (mg/kg)[a]	Revised Cleanup Standard (mg/kg)	Average Concentration in Sediment at SWMU 4 (mg/kg)	Revised Cleanup Standard Met (yes/no)?
Total DDX	0.24	0.75	0.74	Yes
Lead	5.13	136	74	Yes
Selenium	0.62	NA	0.48	Yes

NA = not applicable.
[a] Based on most sensitive species.

Table 2-3. Modification of Selected Remedy for SWMU 4

Remedy Component	Revised Remedy
Excavation of sediment	Unnecessary[a]
Disposal of sediment	Unnecessary
Construction of overflow weir	Unchanged
Construction of sediment trap	Pending evaluation of ability of overflow weir to retain sediment[a]
Evaluation of sediment impacts to ambient water quality criteria	Unchanged[a]
Groundwater monitoring	Unchanged

[a] The remedy requires that water discharged from the Storm Water Detention Pond comply with ambient water quality criteria for the chemicals of concern. If it can be demonstrated that the discharge from the pond meets these criteria, no further action will be required.

SECTION 3.0

3.0 SWMUs 2 AND 3

3.1 Site Description

3.1.1 SWMU 2 consists of two active sewage lagoons that have been in operation since 1942 (Figure 3-1). The lagoons are unlined but bounded by earthen berms. The northern lagoon historically supported abundant vegetation and animal life; this lagoon was cleared annually, sometimes by burning. The southern lagoon historically contained grassy vegetation and reeds. The lagoons currently receive treated effluent discharged from the sewage treatment plant. The lagoons previously received effluent from the motor pool wash rack. Sometime between 1971 and 1979, industrial wastes from a SWMU 3 lagoon overflowed into SWMU 2.

3.1.2 SWMU 3 consisted of two industrial waste lagoons that were situated within the southern lagoon of SWMU 2 (see Figure 3-1). The smaller lagoon was installed in 1972 and was unlined during its first year of use. The larger lagoon was installed between 1975 and 1979 and was lined at the time of construction. Historically, the lagoons received wastewater from the Industrial Waste Pipe Line (IWPL). This wastewater included effluent from the recoup operations from Building 26 (wastewater from repackaging of petroleum products) and effluent from Building 10 (wastewater from paint-stripping, degreasing, and steam-cleaning operations). Appendix A contains information about constituents detected in soil and sediment samples prior to the removal action at SWMUs 2 and 3 (Figures A-4 and A-5).

3.1.3 A removal action was performed at SWMUs 2 and 3 in 1997–1998; approximately 17,951 tons of soil contaminated with pesticides were removed. During the action the industrial waste lagoons (SWMU 3) were removed to expand the southern sewage lagoon. The sewage lagoons were restored and continue to receive effluent from the sewage treatment plant. Standing water is normally just a few inches deep and covers only a small fraction of the total surface of the lagoons. Water may not be present throughout the entire year. The northern lagoon historically supported vegetation and animal life, and the southern lagoon previously contained grasses and reeds. However, all vegetation was removed in the 1997–1998 excavation and has not yet reestablished itself in the lagoons.

3.2 Selected Remedy in the ROD

3.2.1 Excavation and disposal constituted the selected remedy in the ROD for SWMUs 2 and 3. A thorough evaluation of ARARs is provided in Section 10.13.2 of the ROD. Cleanup standards were developed from vadose zone modeling (Montgomery Watson, 1996b), which identified the potential threats to groundwater quality at this site. The cleanup standards were developed to protect human health and ecological receptors. The cleanup standards to protect groundwater quality are consistent with Water Quality Goals (CVRWQCB, 1994). The cleanup standards in the ROD for SWMUs 2 and 3 are as follows:

Analyte	Cleanup Standard (µg/kg)
Selenium[a]	616
Lead[a]	28,300
Dieldrin	370
DDD	1,600
DDE	1,800
DDT	1,700
Total DDX[a]	241
Aldrin	3
Chlordane	10
Diuron	260
Endrin	3
Lindane (Gamma-BHC)	1.7
Monuron	260
2,4-D	47
Heptachlor epoxide	1.5
2,4-Dimethylphenol	330
4-Methylphenol	330
Bis(2-ethylhexyl)phthalate[b]	330
di-n-butylphthalate[b]	330

[a] Cleanup standard for protection of ecological receptors. Others are for soil concentrations to protect groundwater quality.
[b] SWMU 2 only.
µg/kg = micrograms per kilogram

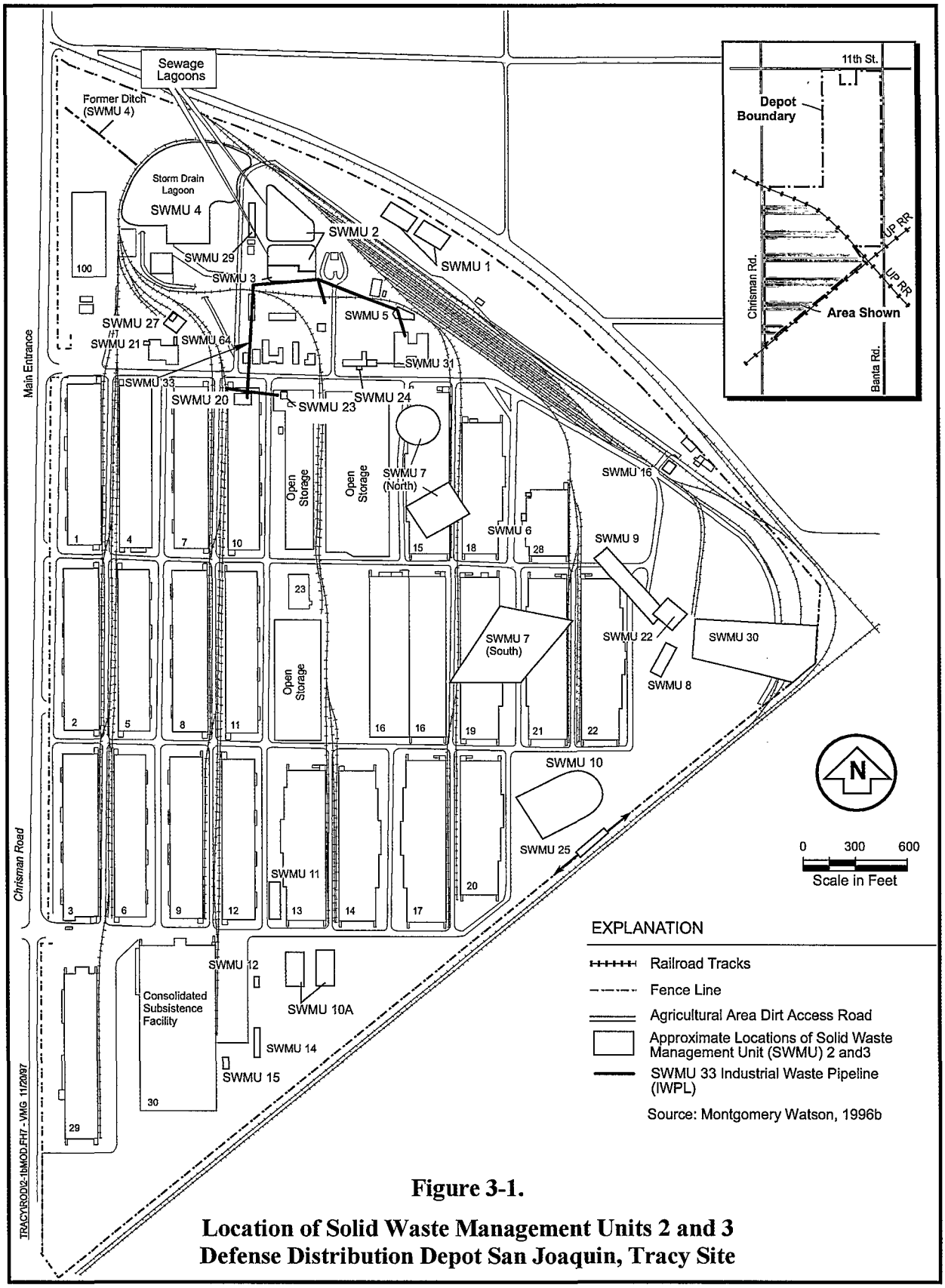


Figure 3-1.

Location of Solid Waste Management Units 2 and 3
Defense Distribution Depot San Joaquin, Tracy Site

3.2.2 Most of the cleanup standards in the ROD correspond to the concentrations determined to be protective of water quality. The cleanup standards for total DDX, lead, and selenium are risk-based standards to protect ecological receptors (see paragraph 6.6.5.3 of the ROD), but these standards were estimated using literature values rather than site-specific BAFs. Paragraph 9.8.1.3 of the ROD acknowledges that the data available to develop cleanup standards were limited at the time of the ROD and that additional data would be collected to obtain site-specific BAFs and that "cleanup standards and the extent of excavation will be revised accordingly through an explanation of significant differences to this ROD."

3.3 Site Remediation Activities

From September 1997 to July 1998, Environmental Chemical Corporation (ECC) performed excavation activities at SWMUs 2 and 3 in accordance with the ROD. When excavation was complete ECC collected samples at the lagoons to confirm that the contaminated soil had been removed. Analytical data from this sampling confirmed that analytes that may lead to groundwater contamination had been removed. (This conclusion will be documented in the forthcoming Remedial Action Report for SWMUs 2, 3, and 33.) Figures 3-2 and 3-3 show the results of the confirmatory sampling at SWMUs 2 and 3.

3.4 Results of Biota Evaluation

3.4.1 In July 1998 additional data were collected to obtain site-specific BAFs. Soil samples were collected from SWMUs 2 and 3 using the methodology presented in *Work Plan for Sampling Biota from Solid Waste Management Unit 4* (Radian, 1998b). Because of the removal action performed at the lagoons in 1997–1998, no biota were present to sample. The soil samples were sent to Caltest Analytical Laboratory, where they were analyzed for total DDX (i.e., DDD, DDE, DDT), lead, and selenium.

3.4.2 Six soil samples were obtained from SWMUs 2 and 3 in July 1998. The samples were analyzed for DDD, DDE, DDT, and lead. The samples were obtained from 0 to 6 inches below ground surface at the locations shown in Figure 3-4. The analytical results for total DDX and lead for the soil samples from SWMUs 2 and 3 are shown in Table 3-1. Additional post-excavation samples were also collected and analyzed for selenium. The analytical results for selenium are shown in Table 3-2.

3.5 Modified Cleanup Standards

3.5.1 As shown in Tables 3-1 and 3-2, the ROD cleanup standards for lead and selenium have been met. The highest lead concentration is 7.4 mg/kg, which is about one-quarter of the ROD cleanup standard of 28.3 mg/kg. Selenium was not detected in any samples. The reporting limit for selenium was 0.2 mg/kg, which is below the ROD cleanup standard of 0.62 mg/kg.

3.5.2 The cleanup level developed in the ROD for total DDX in sediment is 0.241 mg/kg. Although the highest total DDX sample is 1.2 mg/kg and the average total DDX concentration is 0.51 mg/kg, an examination of the sampling results suggests that a higher cleanup level may be appropriate, as discussed below. To undertake this examination, the results from the SWMU 4 sampling need to be evaluated because of a lack of invertebrate data for SWMUs 2 and 3 (a result of the disrupted habitat caused by the removal action).

3.5.3 The cleanup levels for total DDX at SWMUs 2 and 3 are based on assumptions about uptake throughout the food chain and the toxicity of DDX. It is uptake through the food chain that will be examined here.

3.5.4 In the ROD, the killdeer (the spotted sandpiper is used in the calculations) is assumed to obtain 100% of its diet from invertebrates. These invertebrates in turn are assumed to obtain all their nutrients, and contaminants, from the soil at SWMUs 2 and 3. Although it is likely that the soil at SWMUs 2 and 3 is not the only

Notes:
Drawing is not to scale.
DDX is the total of DDD, DDE, and DDT.
Lead samples were collected from restored surface.
Concentrations shown are residual concentrations.
Sample locations where results were non-detect (ND) are not shown.

LEGEND

- Location of Pesticide Pocket
- NL-1401 — Sampling Location
- Dieldrin=0.016 / DDT=0.026 / DDX=0.026 — Concentration of Constituent in mg/kg

NORTH

Dieldrin=0.049
DDE=0.51
DDD=0.11
DDT=0.38
DDX=1.0

Endrin=0.104
Dieldrin=0.204
DDE=0.316
DDD=0.104
DDT=0.117
DDX=0.643

Dieldrin=0.17
DDE=0.48
DDT=0.45
DDX=1.025

NL-1421

Dieldrin=0.056
DDE=0.84
DDD=0.059
DDT=0.2
DDX=1.099
2,4-D=0.0038

NL-1401

NL-1411

Dieldrin=0.024
DDE=0.34
DDT=0.1
DDX=0.44

Pesticide Pocket 1

DDT=0.0042
DDX=0.0042

Endrin=0.104
Dieldrin=0.204
DDE=0.316
DDD=0.104
DDT=0.117
DDX=0.643

NL-1391

NL-1381

NL-0861

NL-0841

DDE=0.032
DDD=0.0054
DDT=0.013
DDX=0.0504

Lead=6.5
DDE=0.19
DDD=0.11
DDT=0.31
DDX=0.61

CS 04

NL-1361

NL-1371

Dieldrin=0.011
DDE=0.11
DDD=0.062
DDT=0.86
DDX=1.032

DDE=0.0069
DDT=0.0049
DDX=0.0118

NL-1351

Dieldrin=0.016
DDE=0.074
DDD=0.044
DDT=0.085
DDX=0.203
2,4-D=0.004

NL-0831

DDD=0.0043
DDX=0.0043

DDT=0.0047
DDX=0.0047

NL-1341

Lead=7.4
DDE=0.021
DDT=0.79
DDX=0.811

NL-1321

Dieldrin=0.0049

Dieldrin=0.19
DDE=1.0
DDD=0.18
DDT=0.38
DDX=1.56

NL-1291

NL-1291
Dieldrin=0.016
DDT=0.026
DDX=0.026

DDD=0.0056
DDT=0.0038
DDX=0.0094

Dieldrin=0.11
DDE=0.11
DDT=0.15
DDX=0.26

Dieldrin=0.18
DDE=0.52
DDD=0.49
DDT=0.56
DDX=1.57

NL-1311

DDT=0.0067
DDX=0.0067

Dieldrin=0.016
DDE=0.087
DDD=0.031
DDT=0.022
DDX=0.338
2,4-D=0.087

NL-1271

NL-1261

CS 05

NL-1251

Dieldrin=0.031
DDE=0.095
DDD=0.12
DDT=0.062
DDX=0.277

Dieldrin=0.011
DDE=0.043
DDT=0.0083
DDX=0.0513

NL-1241

NL-1811

NL-0811

NL-1221

NL-1231

Pesticide Pocket 2

Dieldrin=0.0062
DDE=0.0057
DDX=0.0057

NL-0901

NL-1181

NL-0801

Dieldrin=0.021
DDE=0.08
DDD=0.062
DDT=0.061
DDX=0.203

Dieldrin=0.046
DDE=0.075
DDD=0.016
DDT=0.039
DDX=0.16

DDD=0.0049
DDT=0.0051
DDX=0.01

NL-1201

NL-1211

NL-1161

NL-1171

DDX=0.0014

DDT=0.0034
DDX=0.0034

NL-1141

Dieldrin=0.38
DDE=1.2
DDD=0.27
DDT=1.1
DDX=2.57

NL-1121

NL-1131

DDD=0.0042
DDT=0.004
DDX=0.0082

NL-1151
DDD=0.0067
DDT=0.005
DDX=0.0117

Dieldrin=0.0081
DDE=0.06
DDD=0.034
DDT=0.019
DDX=0.113

Dieldrin=0.01
DDD=0.039
DDX=0.039

NL-1071

NL-0791

Dieldrin=0.029
DDE=0.4
DDD=0.046
DDT=0.28
DDX=0.726

Dieldrin=0.081
DDE=1.0
DDD=0.079
DDT=0.39
DDX=1.469

Dieldrin=0.0039
DDE=0.038
DDD=0.0086
DDT=0.0054
DDX=0.052

NL-1091
DDD=0.0042
DDT=0.0084
DDX=0.0126

NL-1181
DDD=0.005
DDX=0.005

NL-1061
NL-0781

Dieldrin=0.097
DDE=0.75
DDD=0.14
DDT=0.41
DDX=1.3

NL-1111

NL-1101

Dieldrin=0.0057
DDE=0.046
DDD=0.0062
DDT=0.031
DDX=0.0832
2,4-D=0.013

DDE=0.03
DDD=0.0048
DDT=0.011
DDX=0.0458

NL-1011

NL-1011

NL-1021

DDE=0.62
DDD=0.11
DDT=0.24
DDX=0.97

DDE=0.036
DDD=0.0072
DDT=0.014
DDX=0.046

Lead=6.6
DDE=0.021
DDD=0.0093
DDT=0.029
DDX=0.0593

NL-1051

Dieldrin=0.0043

Dieldrin=0.12
DDE=0.65
DDD=0.049
DDT=0.51
DDX=1.209

DDD=0.0043
DDT=0.0088
DDX=0.0131

NL-0921

NL-0911

NL-0771

DDE=0.043
DDD=0.012
DDT=0.029
DDX=0.084

NL-0991

NL-0981

NL-0961

NL-0931

NL-0941

NL-0971

NL-0951

NL-0761

CS 06

DDE=0.004
DDX=0.004

DDD=0.004
DDX=0.004

Dieldrin=0.093
DDE=0.54
DDD=0.072
DDT=0.38
DDX=0.992

NL-0751

Dieldrin=0.0033
DDD=0.013
DDT=0.01
DDX=0.023

Dieldrin=0.028
DDE=0.42
DDD=0.071
DDT=0.22
DDX=0.711

DDE=0.03
DDD=0.33
DDT=0.21
DDX=0.98

DDE=0.034
DDD=0.0048
DDT=0.013
DDX=0.0518

DDE=0.06
DDD=0.012
DDT=0.019
DDX=0.091

DDE=0.088
DDD=0.035
DDT=0.13
DDX=0.253

Dieldrin=0.019
DDE=0.64
DDD=0.21
DDT=0.21
DDX=1.06

RADIAN INTERNATIONAL
A DAMES & MOORE GROUP COMPANY
Walnut Creek, California

Drawn By: JKB | Date: 2/23/99

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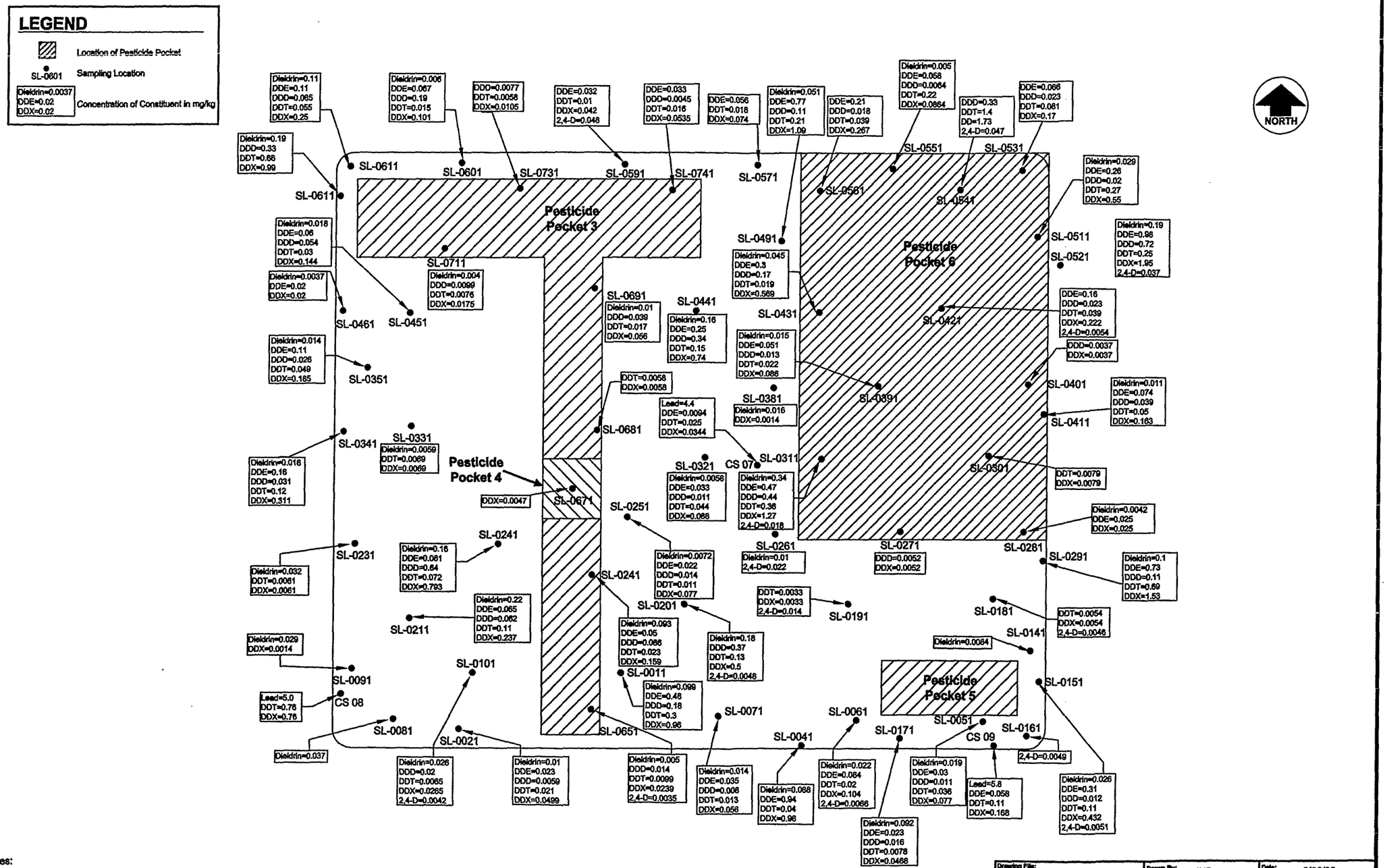
Drawing Title:

Figure 3-2.
Post-Construction Sampling Results for the Northern Sewage Lagoon

Explanation of Significant Differences to the Selected Remedies in the ROD for SWMUs 2, 3, 4, 7, and 33, the Building 30 Drum Storage Area and the Northern Depot Soils Area, DDJC-Tracy



Notes:
Drawing is not to scale.
DDX is the total of DDD, DDE, and DDT.
Lead samples were collected from restored surface.
Concentrations shown are residual concentrations.
Sample locations where results were non-detect (ND) are not shown.

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RADIAN INTERNATIONAL Walnut Creek, California	Drawing Title: Figure 3-3. Post-Construction Sampling Results for the Southern Sewage Lagoon	

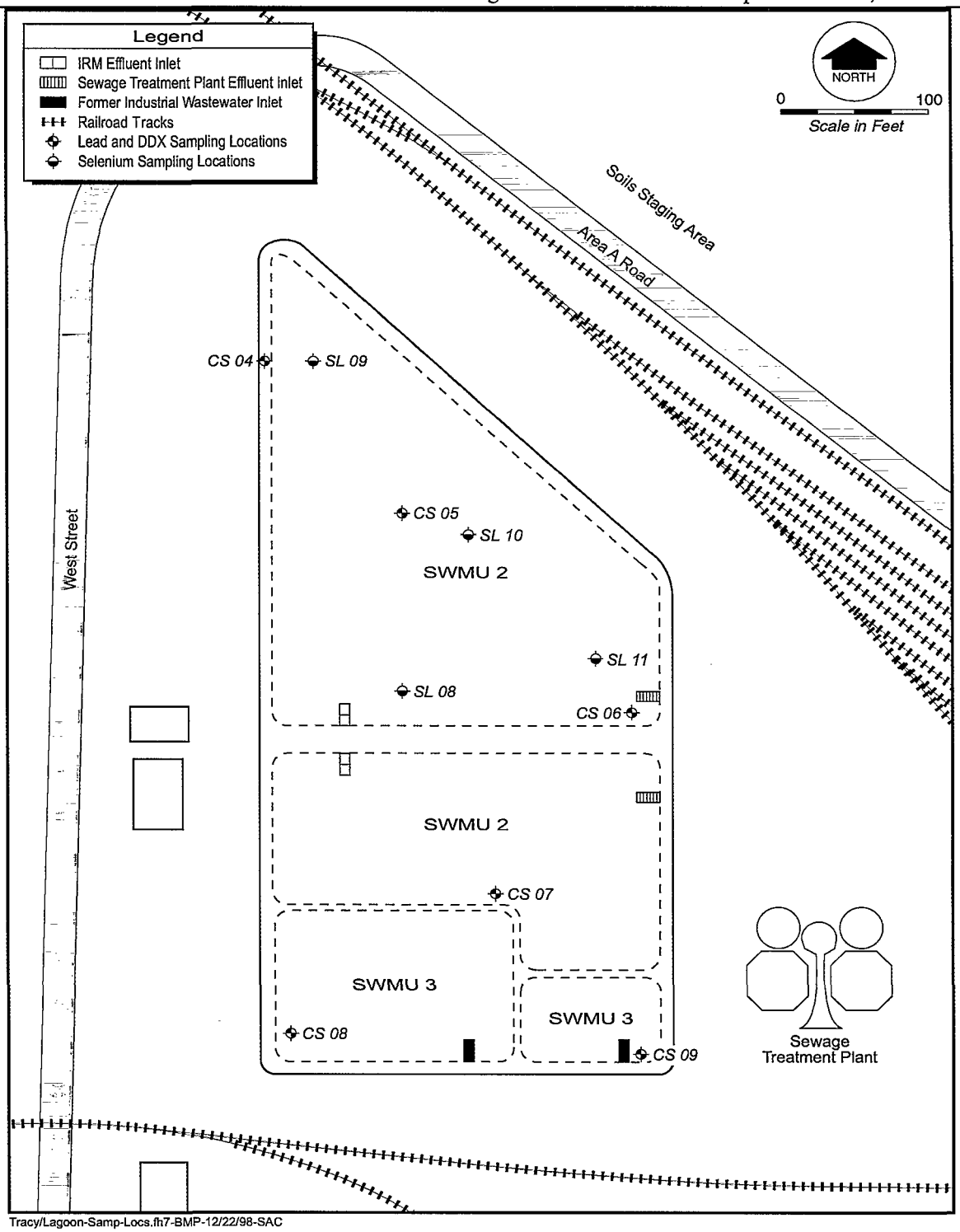

Figure 3-4.

Post-Excavation Sampling Locations for Lagoons
Defense Distribution Depot San Joaquin, Tracy Site

Table 3-1. Analytical Results for DDD, DDE, DDT and Lead for Soil Samples from SWMUs 2 and 3

	DDX			
Sample ID	DDD (mg/kg)	DDE (mg/kg)	DDT (mg/kg)	Pb (mg/kg)
CS 04	0.11	0.19	0.31	6.5
CS 05	ND	0.3	0.79	7.4
CS 06	0.0093	0.021	0.029	6.6
CS 07	ND	0.0094	0.025	4.4
CS 08	ND	ND	0.76	5.0
CS 09	ND	0.058	0.11	5.8
Average		0.514		5.1

ND = nondetect
mg/kg = milligrams per kilogram

Table 3-2. Analytical Results for Selenium for Soil Samples from SWMUs 2 and 3

Sample ID	Selenium (mg/kg)
SL 08	ND
SL 09	ND
SL 10	ND
SL 11	ND

ND = nondetect. The reporting limit is 0.2 mg/kg. Analysis performed in 1997.
mg/kg = milligrams per kilogram

route of exposure for the invertebrates, this assumption does provide a conservative assessment of the BAF for soil uptake. This BAF is used to estimate the concentration of DDX in invertebrates, which are in turn ingested by the killdeer. For the cleanup levels developed in the ROD, the literature value for the BAF was 1.5. However, if the average total DDX concentration in invertebrates from SWMU 4 (0.12 mg/kg, n=3) is divided by the average total DDX concentration in sediment from SWMU 4 (0.94 mg/kg, n=5), the resultant BAF is 0.13, considerably less than the 1.5 assumed for the ROD (see Radian, 1999a, calculation sheet 1 in Appendix B, for details).

3.5.5 Using the site-specific BAF in place of the literature BAF, the sediment cleanup level is 2.8 mg/kg for DDX. The current DDX levels in sediment at SWMUs 2 and 3 are well below this level. The appropriate HQ from residual DDX in sediment is estimated to be 0.8 for the killdeer.

3.6 Modifications to the Selected Remedy

3.6.1 Except for changing the cleanup standard for DDX, there are no changes to the selected remedy for SWMUs 2 and 3. Excavation and disposal of contaminated soil was performed at SWMUs 2 and 3. Confirmatory samples were collected to ensure that the excavation had successfully removed contaminants to the revised cleanup standards. The site-specific cleanup standards for SWMUs 2 and 3 are shown in Table 3-3. Groundwater monitoring will be performed to determine the effectiveness of the selected remedy.

3.6.2 The average concentration of total DDX in the samples from SWMUs 2 and 3 is 0.51 mg/kg, which is below the site-specific cleanup standard of 2.8 mg/kg. The average lead concentration in the samples is 5.95 mg/kg, which is below the cleanup standard of 28.3 mg/kg in the ROD. The selenium concentrations in the samples were found to be non-detect at SWMUs 2 and 3. The reporting limit of 0.2 mg/kg is below the cleanup standard.

3.6.3 The changes to the selected remedy do not reduce its protectiveness of human health and the environment. The additional data collected in the design process were used to refine the risk calculations for ecological receptors. The modified cleanup standards are consistent with the requirements for protecting ecological receptors that were determined in the ROD. The modified remedy is as effective as the remedy presented in the ROD.

Table 3-3. Modified Site-Specific Cleanup Standards at SWMUs 2 and 3

	Cleanup Standard in ROD (mg/kg)[a]	Revised Cleanup Standard (mg/kg)	Average Concentration in Soil at SWMUs 2 and 3 (mg/kg)	Revised Cleanup Standards Met (yes/no)?
Total DDX	0.24	2.8	0.51	Yes
Lead	28.3	NA	6.0	Yes
Selenium	0.62	NA	<0.2	Yes

NA = not applicable.
[a] Based on most sensitive species.

SECTION 4.0

4.0 NORTHERN DEPOT SOILS AREA

4.1 Site Description

The Northern Depot Soils Area (Figure 4-1) is a nonvegetated area immediately north of the Storm Water Detention Pond. The site was reportedly used as a storage area for the National Stockpile of Strategic Metals. From 1980 to 1986, lead ballast was stored in this area. From shortly after World War II until the 1980s, ferrous chromium ore was stored in Quadrants VII and VIII. From shortly after WWII until the 1970s, manganese ore was also stored in this area.

4.2 Selected Remedy in the ROD

4.2.1 Alternative 3, an asphalt cover, was the selected remedy in the ROD for the surface and near-surface soils in the Northern Depot Area. The results of surface and near-surface soil sampling in the Northern Depot Area indicate that arsenic and manganese are present at levels that pose potential noncarcinogenic risks to grader operators and construction workers. The selected remedy consists of installing an asphalt cover over the soils that have elevated levels of arsenic and manganese (approximately 138,000 square feet of soil). The cover will provide a barrier to prevent grader operators or construction workers from coming into contact with the surface soils containing elevated levels of arsenic and manganese. The cover will be inspected annually to ensure that the asphalt remains intact.

4.2.2 A water quality site assessment was not performed for surface or near-surface soils at DDJC-Tracy. However, a quantitative evaluation of the relative mobility of chemicals of potential concern was performed (see Section 4.4 of the *Comprehensive Remedial Investigation/Feasibility Study* [Montgomery Watson, 1996b]). The average contaminant velocities in the vadose zone for metals are very low. Therefore neither arsenic nor manganese pose a threat to groundwater.

4.2.3 A thorough evaluation of ARARs is provided in Section 10.13.2 of the ROD. Cleanup standards correspond to risk-based concentrations that would reduce the hazard index to 1.0. These standards will be used as a benchmark to reassess the need for continued controls in the first five-year site review. The soil cleanup standards presented in the ROD for the Northern Depot Area are:

Analyte	Cleanup Standard (µg/kg)
Arsenic	48
Manganese	1,000

µg/kg = micrograms per kilogram

4.3 Modified Cleanup Standards

4.3.1 From the sampling results, a hazard index of 30 for arsenic and manganese was calculated for the Northern Depot Area. This result was associated with a potential exposure scenario for a depot worker being trained as a grader operator. The original intent of the cleanup standards was to reduce the hazard index to 1.0. However, the cleanup standards in the ROD were incorrect, and did not correspond to a hazard index of 1.0.

4.3.2 The soil in the Northern Depot Area at DDJC-Tracy requires remediation to address unacceptable risks to human health. However, the units for the arsenic and manganese concentrations in Table 8-14 of the RI/FS (Montgomery Watson, 1996b) and in the table following paragraph 9.7.9.3 of the ROD (Radian, 1998a) were incorrect. This conclusion was confirmed by reviewing Table C-65 in *Comprehensive Site-Wide Baseline Risk Assessment* (Montgomery Watson, 1996a). Table C-65 provides the data that were used as a basis for calculating background levels and cleanup standards. The exposure point concentrations in Table C-65 are in mg/kg, not µg/kg. Cleanup standards are obtained by dividing the exposure point concentration by the total hazard quotient.

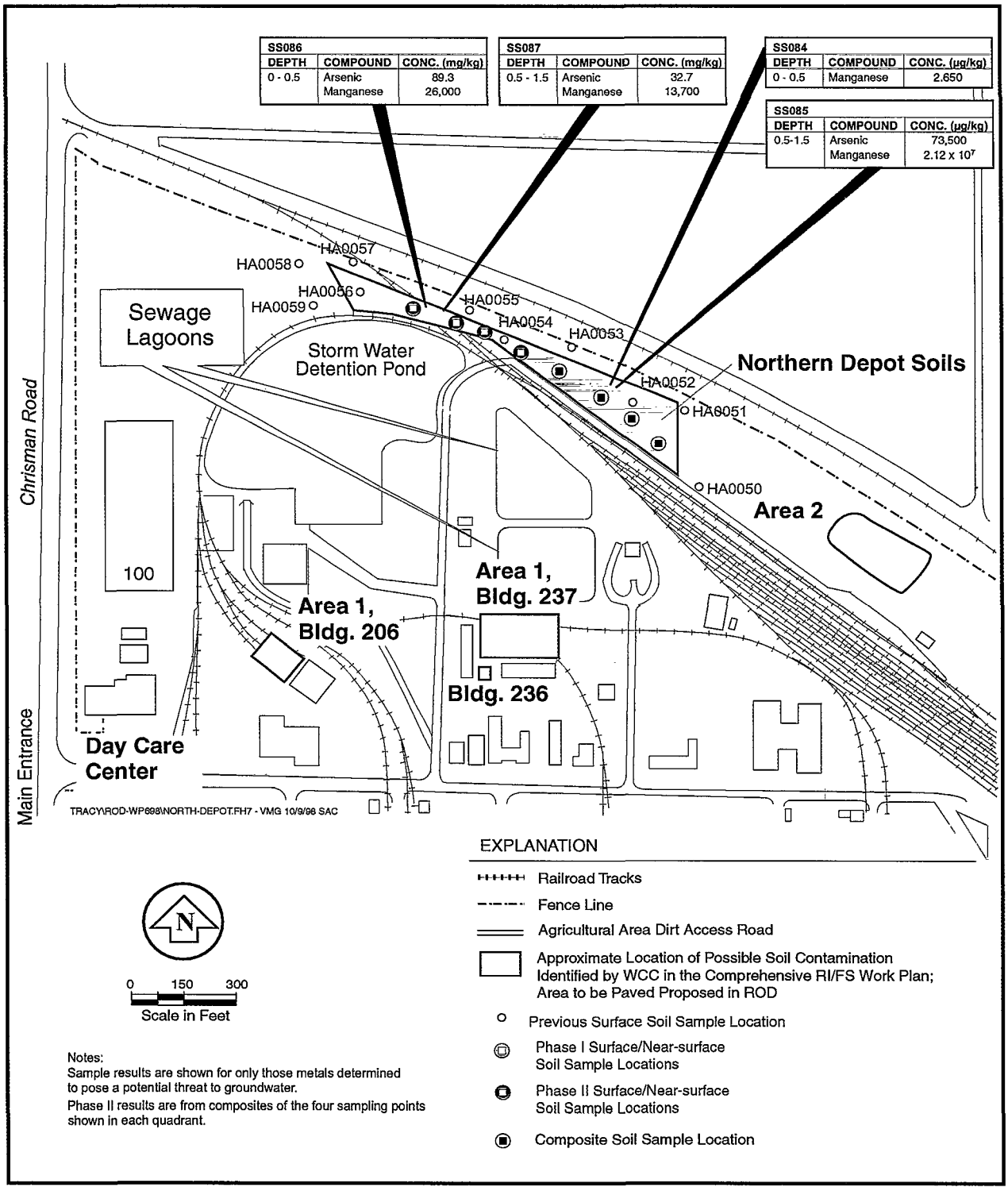

Figure 4-1.
Soil Contamination in Northern Depot Area and Previous Sampling Locations
Defense Distribution Depot San Joaquin, Tracy Site

4.3.3 For arsenic, the cleanup standard is calculated as:

$$62 \text{ mg/kg} \div 1.3 = 48 \text{ mg/kg}.$$

4.3.4 For manganese, the cleanup standard is calculated as:

$$2.6 \times 10^4 \text{ mg/kg} \div 32 = 812.5 \text{ mg/kg}.$$

4.3.5 Note that the cleanup standard for manganese should not be 1,000 mg/kg. In the calculation for Table 8-14 of the RI/FS (Montgomery Watson, 1996b), the hazard quotient for inhalation was used instead of the total hazard quotient.

4.3.6 On the basis of this review, the cleanup standards for arsenic and manganese in soil for the Northern Depot Area for DDJC-Tracy are corrected as indicated in Table 4-1.

Table 4-1. Revised Cleanup Standards for the Northern Depot Soils Area

Analyte	Revised Cleanup Standard (mg/kg)
Arsenic	48
Manganese	812

mg/kg = milligrams per kilogram

4.3.7 The selected remedy is not affected by this correction. An asphalt cover consistent with the dimensions of the cover presented in the ROD is still required for the site.

4.4 Modifications to the Selected Remedy

4.4.1 New requirements for institutional controls at the Northern Depot Soils Area are detailed in Section 6.6.

4.4.2 The modified remedy in the ROD specifies that the asphalt cover be maintained for as long as soil concentrations exceed the established cleanup standard. The selected remedy will have to be reevaluated before any construction that would impact the asphalt cap can be initiated.

SECTION 5.0

5.0 NEW SWMUs

- Note: This section is reserved for the potential addition of soil or groundwater SWMU sites at DDJC-Tracy.

SECTION 6.0

6.0 INSTITUTIONAL CONTROLS

6.1 Institutional Control Protocol

6.1.1 Institutional controls are non-engineering mechanisms (e.g., signs or fences) designed to limit activities or access at a site. Institutional controls are included as part of a selected remedy to prevent unacceptable risks to human health and the environment associated with residual contamination remaining at a site. Institutional controls have also been selected to maintain the effectiveness of a remedy. They are designed to ensure that the public and the environment are fully protected from residual hazardous substances during and after remediation, particularly where the cleanup levels or containment remedies are not compatible with restricted land uses.

6.1.2 Institutional controls are implemented through the process for planning and approving changes to land use and related construction projects at a site. Institutional controls are recorded in the *Addendum to Future Use Development Report* (Radian, 1999b) and the Base Master Planner ensures that they are implemented correctly.

6.1.3 The attachment at the end of Section 6.0 is the documented protocol for institutional controls at open bases prepared by the California Military Environmental Coordination Committee (CMECC) Site Cleanup Performance Action Team. The purpose of the protocol is to provide guidance to project teams on the implementation of institutional controls at open military bases.

6.2 Institutional Control Sites

6.2.1 At DDJC-Tracy, SWMUs 7, 33, the Building 30 Drum Storage Area, and the Northern Depot Soils Area require institutional controls as part of their selected remedies in the ROD.

6.3 SWMU 7 - Burn Pit No. 1

6.3.1 Institutional controls at SWMU 7 require that the existing structures and pavement at SWMU 7 be maintained. Removal and/or modification of the pavement or building slabs constitutes disruption of the selected remedy and triggers notification of the agencies and follow-up activities to ensure that the controls are fully restored. Maintaining the existing structures and pavement prevents the infiltration of surface runoff that could otherwise transport contaminants to groundwater.

6.3.2 SWMU 7 (Figures 6-1 and 6-2) consists of seven pits that were reportedly operated before the construction of the warehouse and buildings currently at the site. The pits were used for the disposal of medical supplies, narcotics, general pharmaceuticals, and electron tubes. The pits may have been up to 16 feet deep; ashes were removed and transported to off-site landfills during the later years of operation (WCC, 1992).

6.3.3 Baseline risk assessment results show no potential risks to human or ecological receptors. Vadose zone modeling results indicate that total petroleum hydrocarbons as diesel (TPHD) in Pit D, volatile organic compounds (VOCs) in Pit F, semivolatile organic compounds (SVOCs) in Pit C, and pesticides and herbicides detected in SWMU 7 soils may pose a threat to background groundwater quality uses at two of the pits; however, this threat has not been confirmed by the results of groundwater monitoring conducted to date. Trichloroethene and 1,2 dichloroethene were detected in Pit F at maximum concentrations of 7.1 micrograms per kilogram (µg/kg) and 22 µg/kg, respectively. Dieldrin, linuron, and bis (2-ethylhexyl)-phthalate were detected in Pit C at maximum concentrations of 69.5 µg/kg, 360 µg/kg, and 5,700 µg/kg, respectively. Dieldrin, linuron, simazine, 2,4-D, and TPHD were detected in Pit D at maximum concentrations of 7.49 µg/kg, 270 µg/kg, 79.4 µg/kg, 23.4 µg/kg, and 320 µg/kg, respectively.

6.3.4 Because portions of the seven pits are covered by buildings, and groundwater contamination is not present at the site, institutional controls were chosen as the selected remedy. By covering portions of the pits, the

building foundations prevent adverse exposure to receptors and mitigate groundwater threats by reducing rainwater infiltration.

6.3.5 The cleanup standards developed in the ROD to protect background groundwater quality are consistent with Water Quality Goals (CVRWQCB, 1994). Until it is demonstrated that the residual soil contamination at SWMU 7 is below these standards or that the residual levels pose no threat to groundwater quality, the institutional controls identified in this addendum must be maintained. The cleanup standards are as follows:

Analytes	SWMU 7 Cleanup standards (µg/kg)
1,2-Dichloroethene (Pit F)	10
Trichloroethene (Pit F)	5
Bis(2-ethylhexyl)phthalate (Pit C)	330
2,4-D	25
Dieldrin (Pit C and D)	3
Linuron (Pit C and D)	200
Simazine (Pit D)	10
TPHD (Pit D)	100,000

µg/kg = micrograms per kilogram

6.3.6 The selected remedy specifies that for Buildings 15, 19, and 21 and the pavement within the affected area shown in Figures 6-1 and 6-2 the signatory parties to the ROD must be notified at least 90 days before any demolition or construction activities that could expose contaminated soil. The notification shall include:

- A description of the proposed work with a figure identifying the affected area;
- An evaluation of potential impacts to the environment;
- An assessment of whether the proposed activity changes the appropriateness of the ROD remedy; and
- A discussion of the engineering controls that will be used to prevent impacts.

6.3.7 Following completion of any demolition or construction activities but before the demobilization of the construction contractor, the agencies will be notified and given an opportunity to inspect the completed site work.

6.3.8 Warning signs will be placed at the affected areas, as shown in Figures 6-1 and 6-2. If ownership of the installation is transferred to private or nonfederal entities in the future, restrictive covenants will be written into the land property deed to prevent schools, playgrounds, hospitals, or housing from being built at the sites until COCs are below levels of concern. Cooperation between the Defense Logistics Agency, the U.S. Army, San Joaquin County, and the signatories to the ROD will be required to enact the restrictions on access and land use.

6.4 Building 30 Drum Storage Area

6.4.1 Institutional controls at the Building 30 Drum Storage Area require that existing structures and pavement in this area be maintained. Removal and/or modification of the pavement or building slabs constitutes disruption of the selected remedy and triggers notification of the agencies and follow-up activities to ensure that the controls are fully restored. Maintaining the existing structures and pavement prevents the infiltration of surface runoff that could otherwise transport contaminants to groundwater.

6.4.2 The Building 30 Drum Storage Area is located in the southern portion of the depot, near the Consolidated Subsistence Facility (Figure 6-3). During construction of the facility, buried drums were discovered in the vicinity of the Building 30 Drum Storage Area. The site now encompasses a relatively small area between a forklift ramp and the central office on the north side of the Consolidated Subsistence Facility.

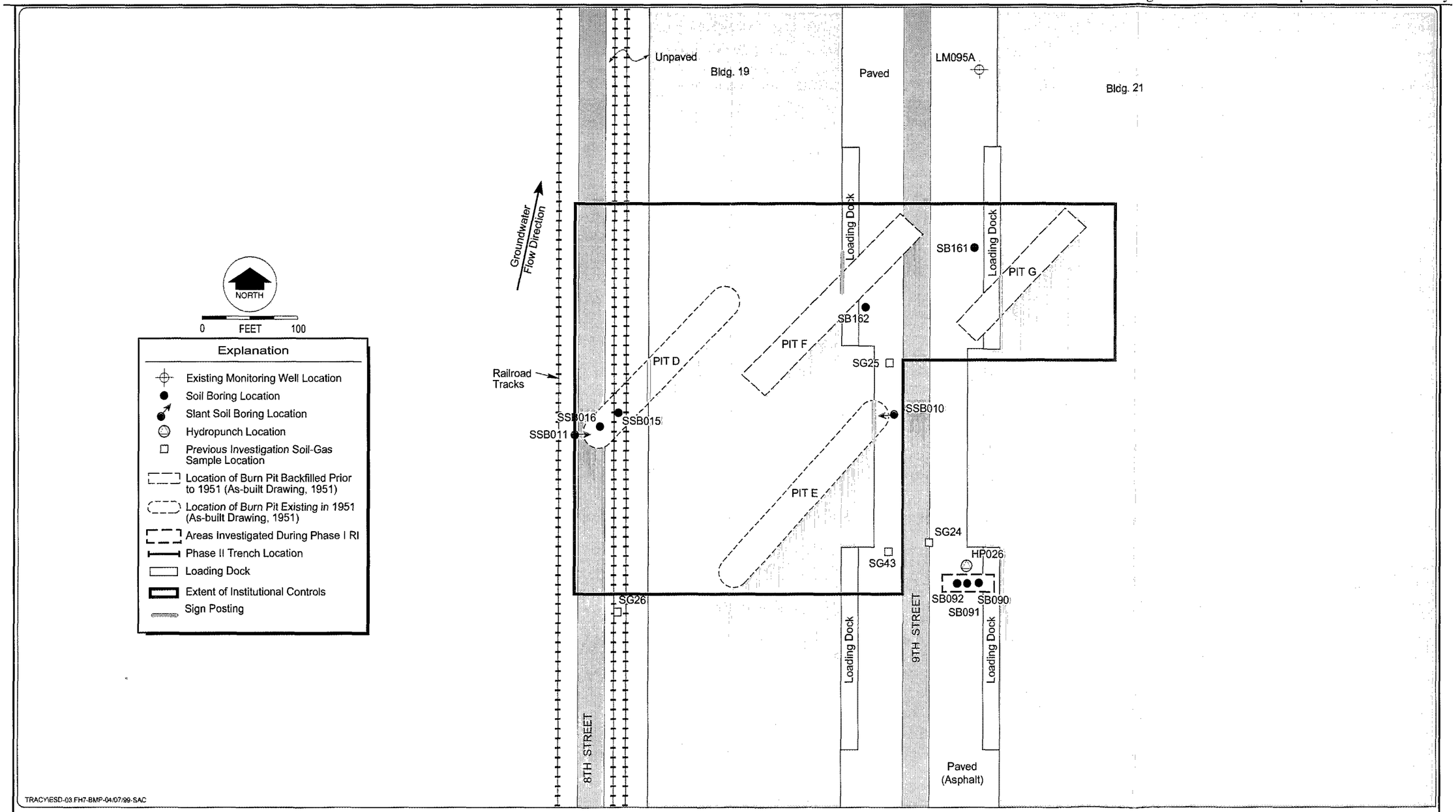

Figure 6-1
Institutional Controls for
SWMU 7- (South Area) – Burn Pit No. 1
Defense Distribution Depot San Joaquin - Tracy

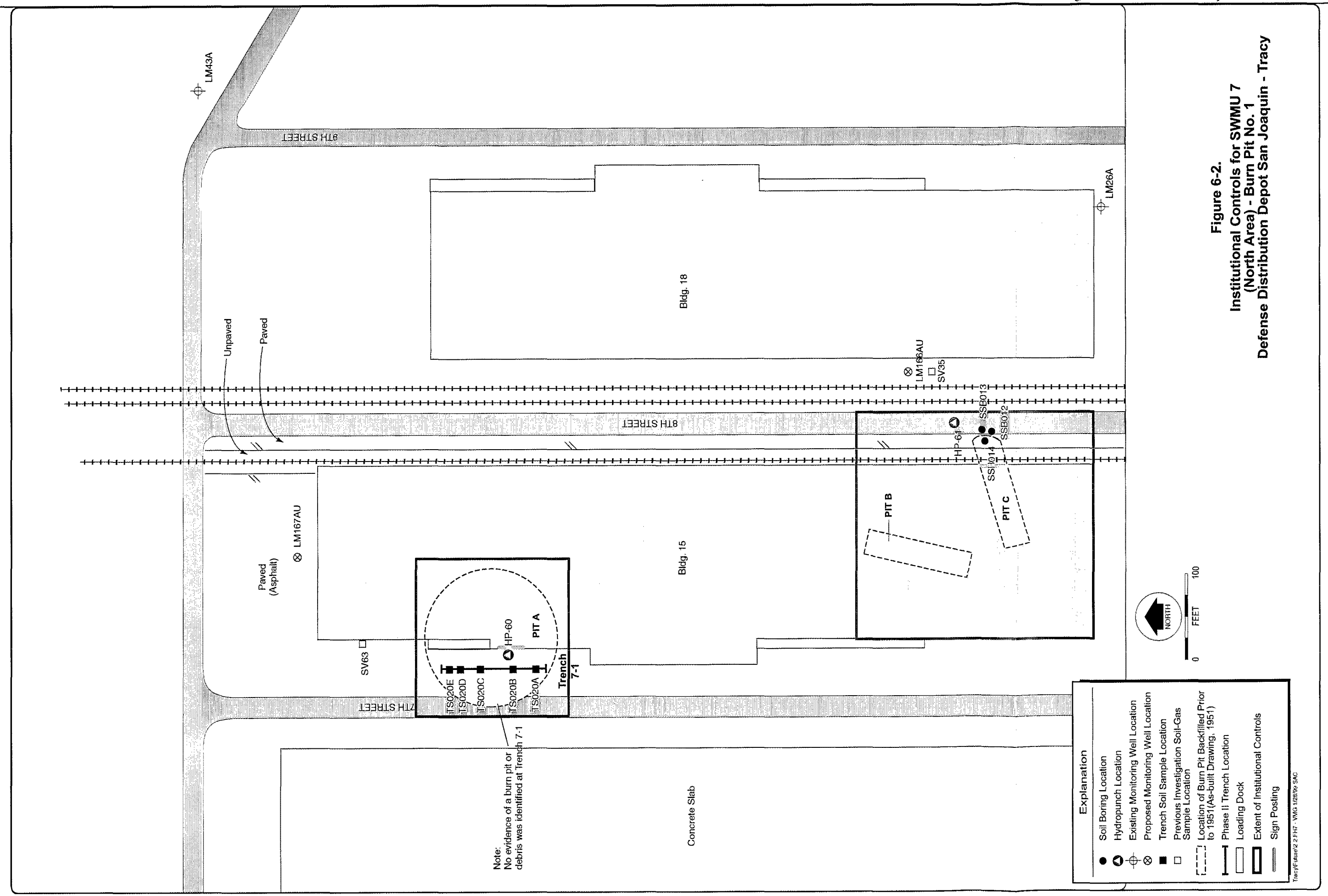

Figure 6-2.
Institutional Controls for SWMU 7
(North Area) - Burn Pit No. 1
Defense Distribution Depot San Joaquin - Tracy

6.4.3 Bis(2-ethylhexyl)phthalate (maximum concentration of 2,800 µg/kg) and di-n-butylphthalate (maximum concentration of 96,000 µg/kg) were detected several times in soil samples collected at the site. Benzyl alcohol (1,300 µg/kg) and diethylphthalate (230 µg/kg) were detected in one sample. Although phthalates are commonly introduced into environmental samples as part of laboratory analytical procedures, the distribution and magnitude of the concentrations indicate that these detected concentrations may be representative of site conditions.

6.4.4 The cleanup standards developed in the ROD to protect background groundwater quality are consistent with Water Quality Goals (CVRWQCB, 1994). Until it is demonstrated that the residual soil contamination at the Building 30 Drum Storage Area is below these standards or that the residual levels pose no threat to groundwater quality, the institutional controls identified in this addendum must be maintained. The soil cleanup standards are as follows:

Analytes	Building 30 Cleanup Standards (µg/kg)
Benzyl Alcohol	330
Bis(2-ethylhexyl) phthalate	330
Diethylphthalate	330
di-n-Butylphthalate	330

µg/kg = micrograms per kilogram

6.4.5 The selected remedy specifies that for Building 30 and the pavement within the affected area shown in Figure 6-3 the signatory parties to the ROD must be notified at least 90 days before any demolition or construction activities that could expose contaminated soil. The notification shall include:

- A description of the proposed work with a figure identifying the affected area;
- An evaluation of potential impacts to the environment;
- An assessment of whether the proposed activity changes the appropriateness of the ROD remedy; and
- A discussion of the engineering controls that will be used to prevent impacts.

6.4.6 Following completion of any demolition or construction activities but before the demobilization of the construction contractor, the agencies will be notified and given an opportunity to inspect the completed site work.

6.4.7 Warning signs will be placed in the affected area, as shown in Figure 6-3. If ownership of the installation is transferred to private or nonfederal entities in the future, restrictive covenants will be written into the land property deed to prevent schools, playgrounds, hospitals, or housing from being built at the sites until the COCs are below levels of concern. Cooperation between the DLA, the U.S. Army, San Joaquin County, and the signatories to the ROD will be required to enact the restrictions on access and land use.

6.5 SWMU 33 - Industrial Waste Pipeline

6.5.1 "Grouting, limited excavation, and institutional controls" is the selected alternative for SWMU 33. These controls require that the existing pavement/compacted gravel covering portions of SWMU 33 with contaminants exceeding the cleanup standard be maintained. Removal and/or modification of the pavement or compacted gravel cover constitutes disruption of the selected remedy and triggers notification of the agencies and follow-up activities to ensure that the controls are fully restored. Maintaining the existing pavement and other compacted surfaces prevents the infiltration of surface runoff that could otherwise transport contaminants to groundwater.

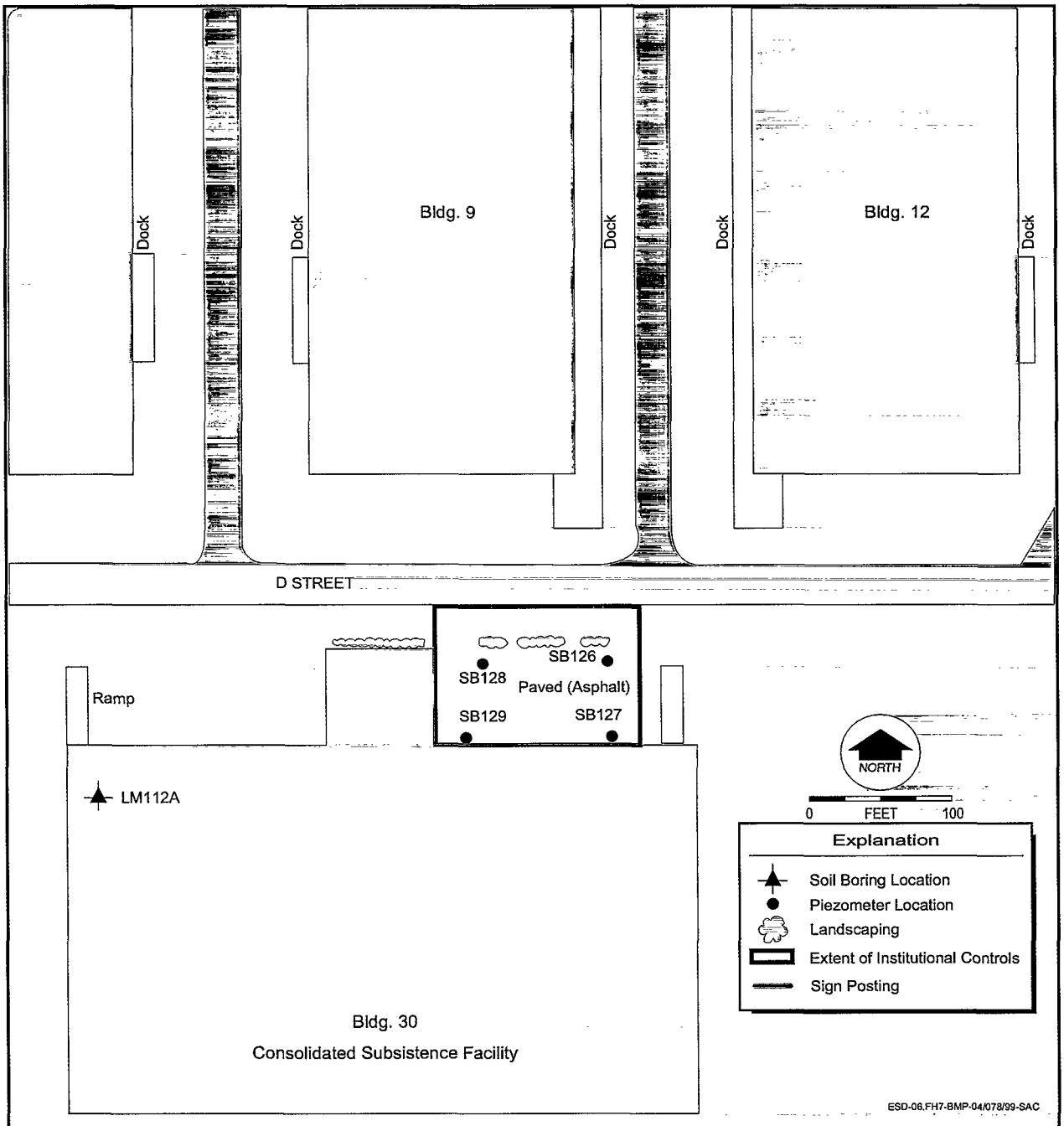

Figure 6-3.

Institutional Controls for Building 30 – Drum Storage Area
Defense Distribution Depot San Joaquin - Tracy

6.5.2 In 1972, an existing pipeline and a storm drain line were interconnected to form the industrial waste pipeline (IWPL) at SWMU 33. The IWPL is constructed of 4-inch- to 7-inch-diameter pipe of varying composition (transite, vitrified clay, polyvinyl chloride) and is buried to a depth of approximately two to four feet below grade. Eight manholes are located along the pipeline. The pipeline consists of two major segments referred to as the south industrial waste pipeline (SIWPL) and the east industrial waste pipeline (EIWPL). The total length of the SIWPL and its branches is approximately 1,200 lineal feet. The total length of the EIWPL and its branches is also approximately 1,200 lineal feet. Use of the IWPL has been discontinued. A removal action has already been performed to accomplish the excavation and pipe grouting requirements of the ROD.

6.5.3 Xylene was reported in soil samples collected at SWMU 33 at concentrations of up to 32 µg/kg. Naphthalene (maximum concentration of 2,800 µg/kg) and TPHD (maximum concentration 15,100 µg/kg) were also reported. Several pesticides, including aldrin (maximum concentration of 1.54 µg/kg), carbaryl (maximum concentration of 540 µg/kg), dieldrin (maximum concentration of 22.6 µg/kg), and methiocarb (maximum concentration of 3,200 µg/kg), were reported. Diethylphthalate and di-n-butylphthalate were reported at concentrations of up to 130 µg/kg and 1,900 µg/kg, respectively.

6.5.4 The cleanup standards developed in the ROD are consistent with Water Quality Goals (CVRWQCB, 1994) and the Tri-Regional Guidelines. Until it is demonstrated that the residual soil contamination at SWMU 33 is below these standards or that the residual levels pose no threat to groundwater quality, the institutional controls identified for SWMU 33 must be maintained. The proposed cleanup standards are as follows:

Analytes	SWMU 33 Cleanup Standards (µg/kg)
Xylenes	5
Diethylphthalate	330
Di-n-butylphthalate	330
Naphthalene	330
Aldrin	1.7
Carbaryl	400
Dieldrin	2
Methiocarb	500
TPHD	100,000

µg/kg = micrograms per kilogram

6.5.5 The selected remedy specifies that for the affected areas of the IWPL shown in Figure 6-4, the signatory parties to the ROD must be notified at least 90 days before any demolition or construction activities that could expose contaminated soil. Figure 6-4 identifies portions of the IWPL that have restricted use. These areas are known to have contaminants present in concentrations that are greater than the cleanup standards identified above. The notification shall include:

- A description of the proposed work with a figure identifying the affected area;
- An evaluation of potential impacts to the environment;
- An assessment of whether the proposed activity changes the appropriateness of the ROD remedy; and
- A discussion of the engineering controls that will be used to prevent impacts.

6.5.6 Following completion of any demolition or construction activities but before the demobilization of the construction contractor, the agencies will be notified and given an opportunity to inspect the completed site work.

6.5.7 Warning signs will be placed in the affected area, as shown in Figure 6-4. If ownership of the installation is transferred to private or nonfederal entities in the future,

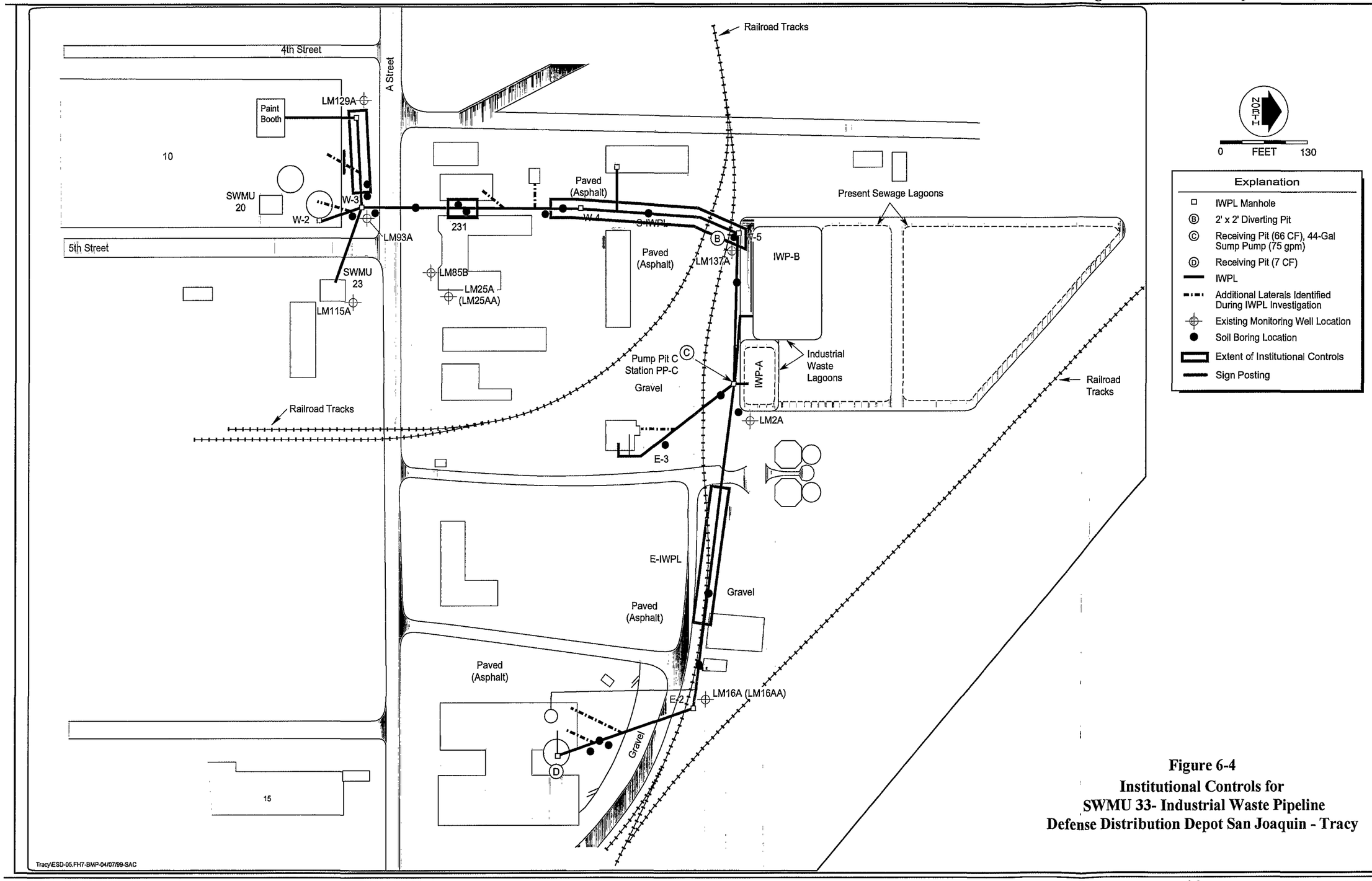

Figure 6-4
Institutional Controls for
SWMU 33- Industrial Waste Pipeline
Defense Distribution Depot San Joaquin - Tracy

restrictive covenants will written into the land property deed to prevent schools, playgrounds, hospitals, or housing from being built at the sites until the COCs are below levels of concern. Cooperation between the DLA, the U.S. Army, San Joaquin County, and the signatories to the DDJC ROD will be required to enact the restrictions on access and land use.

6.6 Northern Depot Soils Area

6.6.1 The construction of an asphalt cap is the selected remedy for the Northern Depot Soils Area. Institutional controls will be used to maintain the cap. The Remedial Action Report will detail the installation of the asphalt cap, along with its specific inspection and maintenance requirements. The land use restrictions for the paved areas require that the asphalt cap constructed at the Northern Depot Soils Area be maintained. Removal and/or modification of the pavement constitutes disruption of the selected remedy and triggers notification of the agencies and follow-up activities to ensure that the controls are fully restored. Maintaining the existing pavement prevents the potential exposure of site workers to arsenic and manganese in the surface soil.

6.6.2 The Northern Depot Soils Area (Figure 6-5) is a nonvegetated area of soil. The results of sampling in surface and near-surface soils indicate that arsenic (maximum concentration of 89.3 mg/kg) and manganese (maximum concentration of 26,000 mg/kg) are present at levels that pose potential noncarcinogenic risks to grader operators and construction workers. The elevated arsenic and manganese levels are related to ore stockpiles previously located in the Northern Depot Soils Area.

6.6.3 The selected remedy (asphalt cap) provides a barrier to prevent construction workers from coming into contact with surface soils containing elevated levels of arsenic and manganese. The depot may continue to store materials at this location as long as the asphalt cap is adequately maintained.

6.6.4 Until it is demonstrated that the residual soil contamination at the Northern Depot Soils Area is below cleanup standards, the institutional controls must be maintained. The cleanup standards are as follows:

Analytes	Cleanup standards (mg/kg)
Arsenic	48
Manganese	812

mg/kg = milligrams per kilogram

6.6.5 The selected remedy specifies that for the asphalt cap the signatory parties to the ROD must be notified at least 90 days before any demolition or construction activities occur that could expose contaminated soil. The notification shall include:

- A description of the proposed work with a figure identifying the affected area;
- An evaluation of potential impacts to the environment;
- An assessment of whether the proposed activity changes the appropriateness of the ROD remedy; and
- A discussion of the engineering controls that will be used to prevent impacts.

6.6.6 Following completion of any demolition or construction activities but before the demobilization of the construction contractor, the agencies will be notified and given an opportunity to inspect the completed site work.

6.6.7 Warning signs will be placed in the affected area, as shown in Figure 6-5. If ownership of the installation is transferred to private or nonfederal entities in the future, restrictive covenants will be written into the land property deed to prevent schools, playgrounds, hospitals, or housing from being built at the sites until COCs are below levels of concern. Cooperation between the DLA, the U.S. Army, San Joaquin County, and the signatories to the

ROD will be required to enact the restrictions on access and land use.

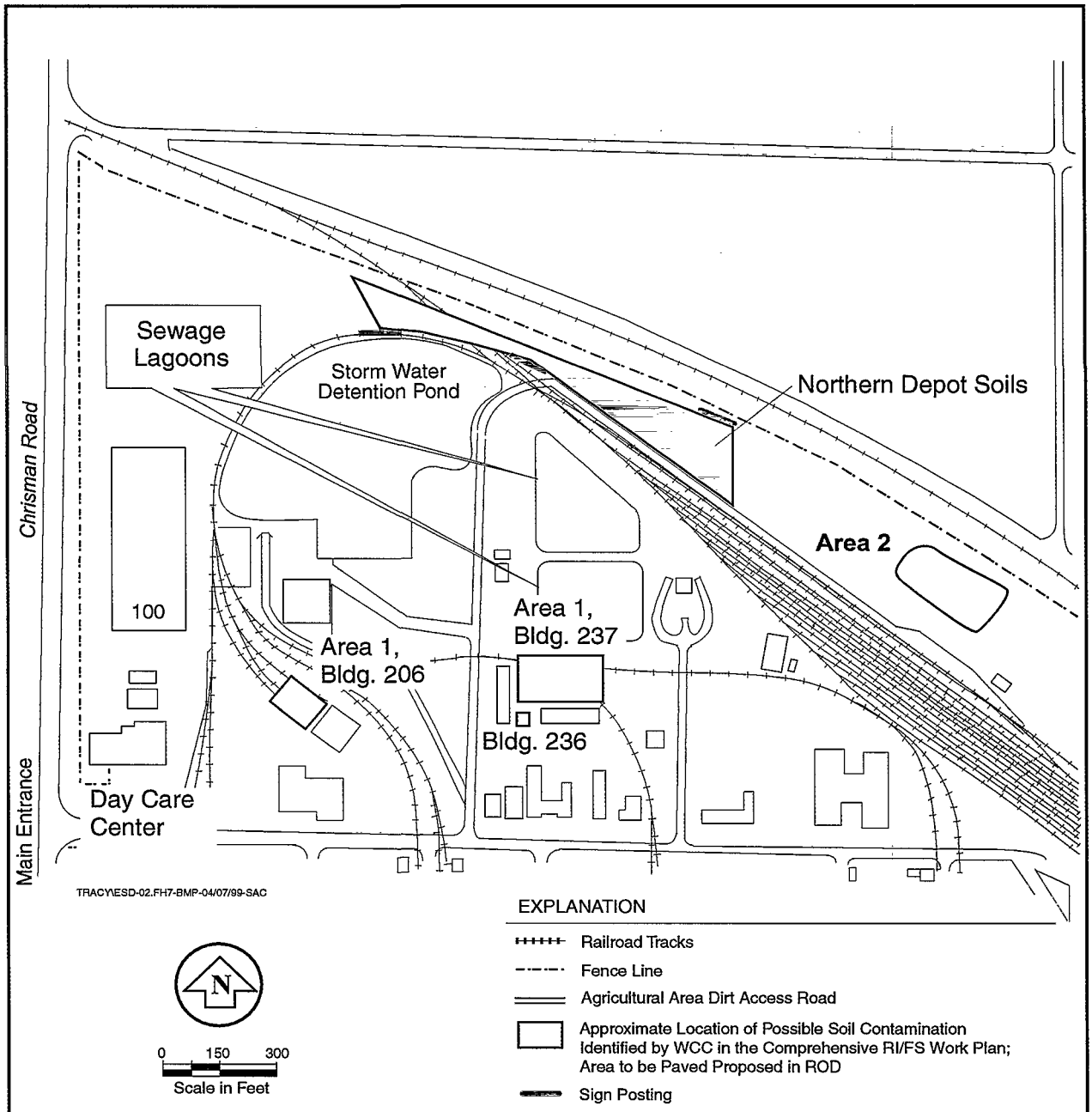

Figure 6-5.

Institutional Controls for the Northern Depot Soils Area
Defense Distribution Depot San Joaquin - Tracy

SECTION 7.0

7.0 REFERENCES

CVRWQCB, 1994. *Basin Plan for the Central Valley Region: Sacramento River and San Joaquin River Basins.* Central Valley Regional Water Quality Control Board.

Jones & Stokes Associates, Inc., 1998a. *Food Web Assessment Report for Solid Waste Management Unit 4, Defense Distribution Region West, Tracy.* June.

Jones & Stokes Associates, Inc., 1998b. Personal Communication.

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Montgomery Watson, 1996b. *DDRW-Tracy California, Final Comprehensive Remedial Investigation/Feasibility Study. Volumes I and II.*

Radian International, 1998a. *Site-Wide Comprehensive Record of Decision, Defense Distribution Depot San Joaquin, Tracy Site, Tracy, California.* Final. April.

Radian International, 1998b. *Work Plan for Sampling Biota from Solid Waste Management Unit 4.* Appendix C to the Draft *DDJC – Tracy Remedial Design Work Plan.* Final. July.

Radian International, 1999a. *Evaluation of Biota Sampling for Solid Waste Management Units 2, 3, and 4: Engineering Technical Memorandum.* Final. April.

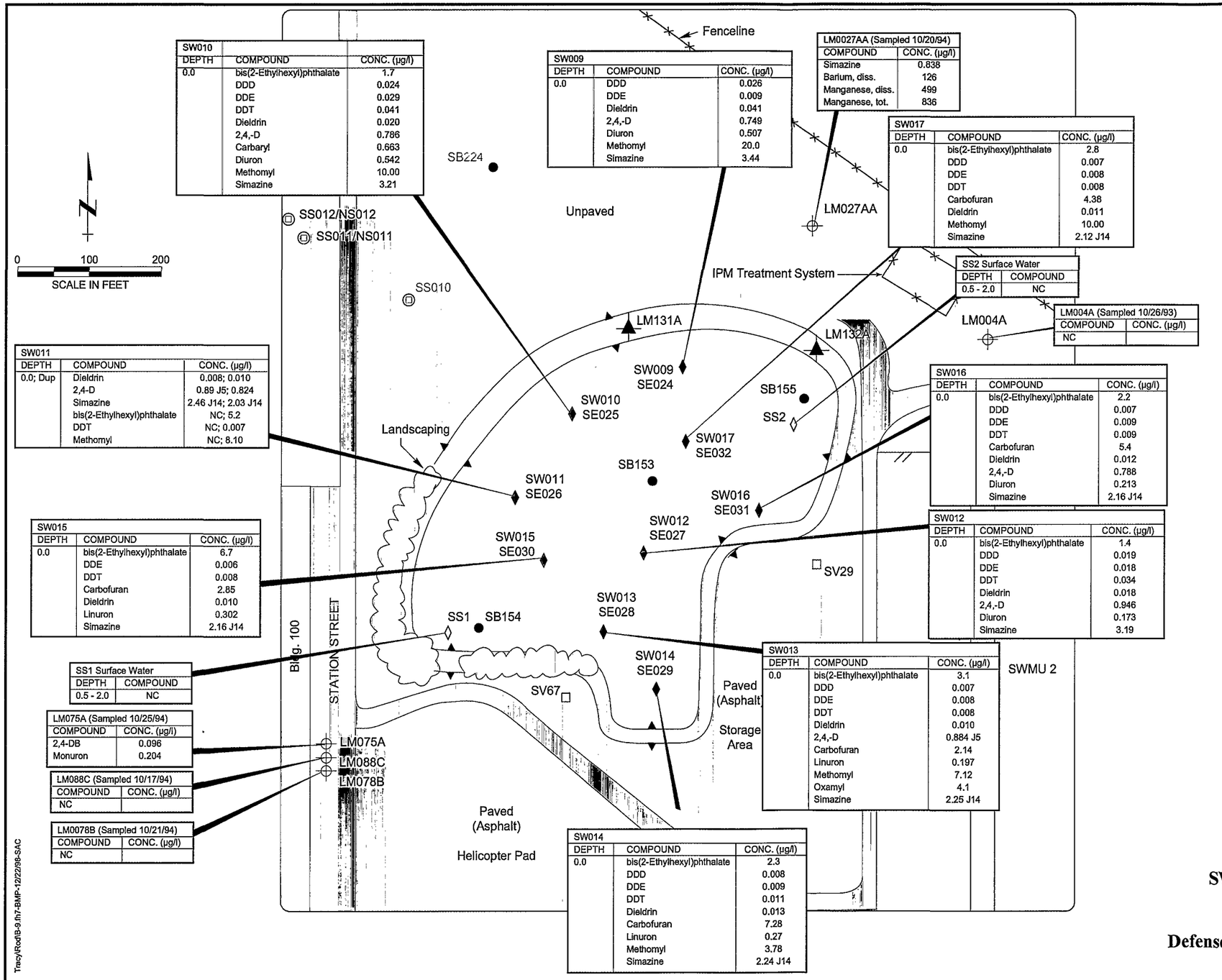
Radian International, 1999b. *Addendum to Future Development Report.* Final. January.

WCC, 1992. *Final Comprehensive RI/FS Work Plan, DDRW-Tracy.* September.

APPENDIX A

APPENDIX A

ADDITIONAL INFORMATION ABOUT SAMPLING RESULTS FOR SWMUs 2, 3, AND 4



EXPLANATION

- Existing Monitoring Well Location
- Existing Piezometer Location
- Soil Boring Location (SWMU 4 soil boring samples were collected from the surface only)
- Phase I Surface/Near Surface Sample Location
- Phase II Sediment/Surface Water Sample Location
- Previous Investigation Sediment Sample Location
- Previous Investigation Soil-Gas Sample Location (approximate)
- Earthen Berm
- Storm Drain Lagoon (Unlined)
- Edge of Pavement

Notes:
Sample results are shown for only those metals detected at concentrations above established DDRW-Tracy background levels.

NC = No constituents detected above laboratory reporting limit or above background.

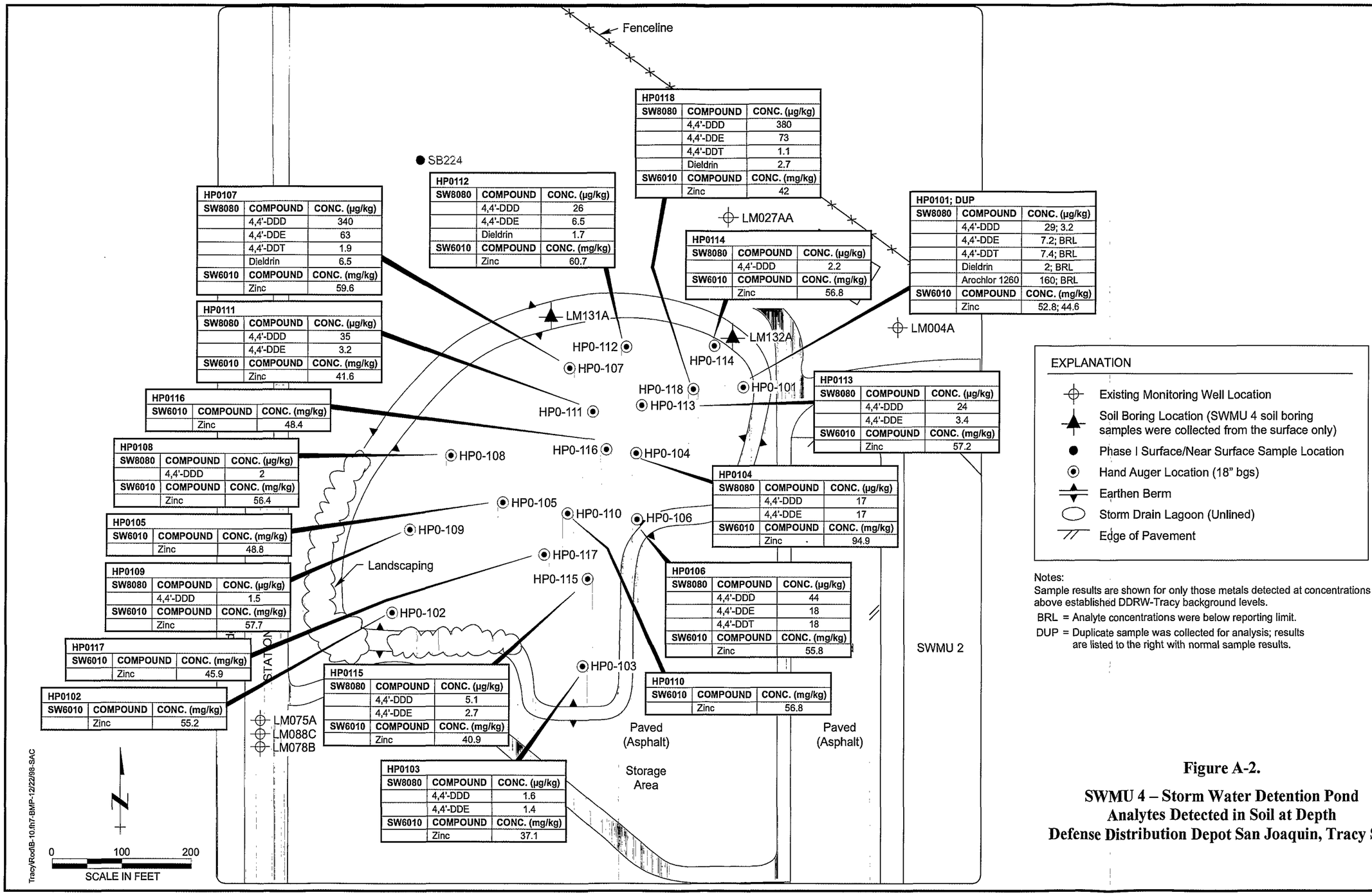
J,J15 = Data qualifier flags and comments. For an explanation of flags and comments, see Table A-1.

DUP = Duplicate sample was collected for analysis; results are listed to the right with normal sample results.

Source: Montgomery Watson, 1996b

Figure A-1.

SWMU 4 – Storm Water Detention Pond Constituents Detected in Surface Water and Groundwater Samples Defense Distribution Depot San Joaquin, Tracy Site



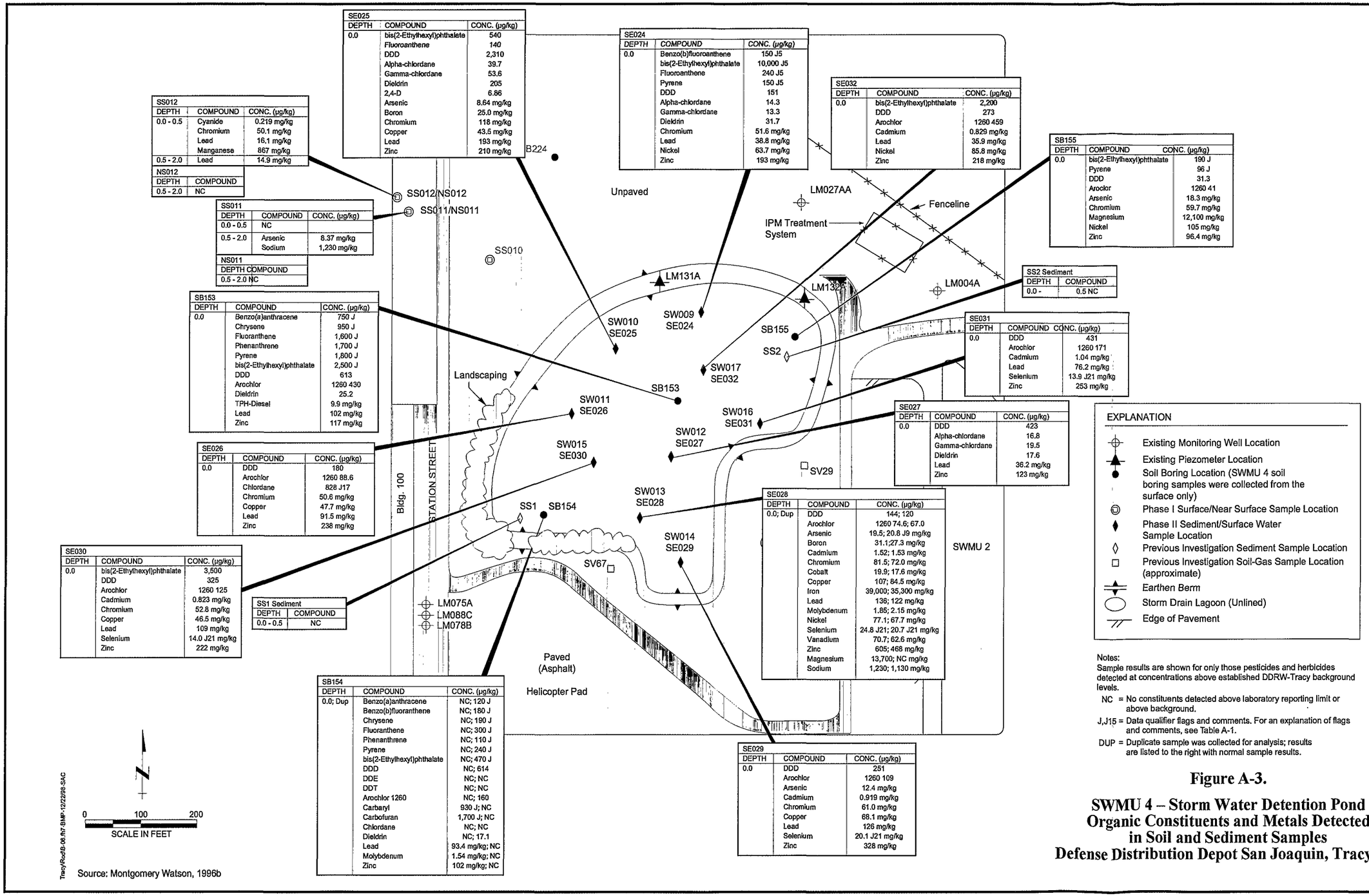
Notes:
Sample results are shown for only those metals detected at concentrations above established DDRW-Tracy background levels.

BRL = Analyte concentrations were below reporting limit.

DUP = Duplicate sample was collected for analysis; results are listed to the right with normal sample results.

Figure A-2.

SWMU 4 – Storm Water Detention Pond
Analytes Detected in Soil at Depth
Defense Distribution Depot San Joaquin, Tracy Site



Notes:
Sample results are shown for only those pesticides and herbicides detected at concentrations above established DDRW-Tracy background levels.

NC = No constituents detected above laboratory reporting limit or above background.

J,J15 = Data qualifier flags and comments. For an explanation of flags and comments, see Table A-1.

DUP = Duplicate sample was collected for analysis; results are listed to the right with normal sample results.

Figure A-3.

SWMU 4 – Storm Water Detention Pond Organic Constituents and Metals Detected in Soil and Sediment Samples Defense Distribution Depot San Joaquin, Tracy Site

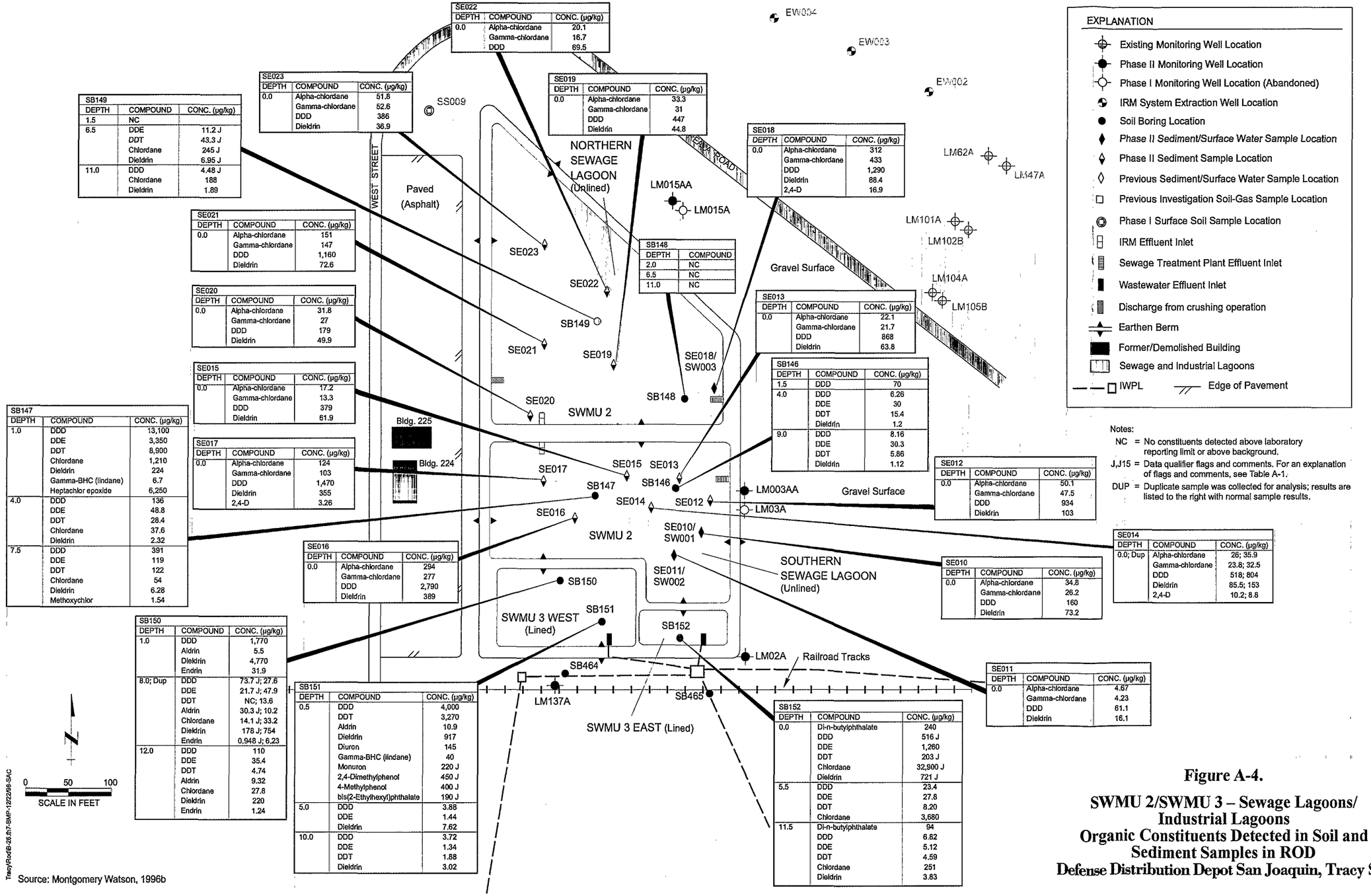


Figure A-4.

SWMU 2/SWMU 3 – Sewage Lagoons/ Industrial Lagoons
Organic Constituents Detected in Soil and Sediment Samples in ROD
Defense Distribution Depot San Joaquin, Tracy Site

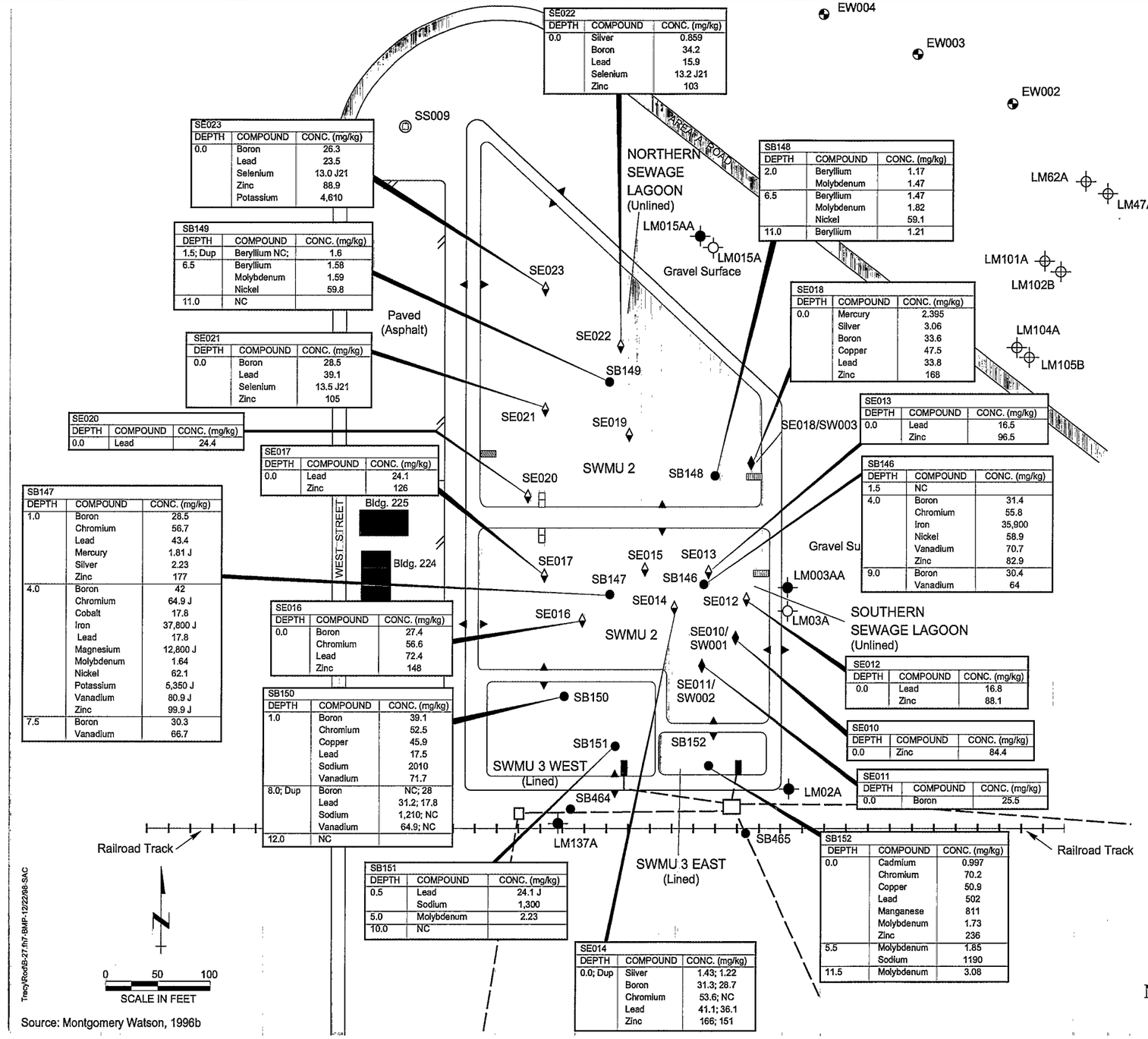


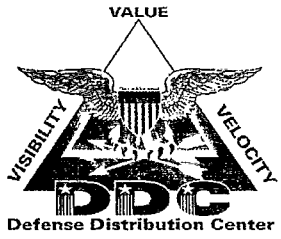
Figure A-5.

SWMU 2/SWMU 3 – Sewage Lagoons/ Industrial Lagoons
Metals Detected in Soil and Sediment Samples in ROD Defense Distribution Depot San Joaquin, Tracy Site

Table A-1. Summary of Data Flags and Figure Abbreviations

Comments	Explanation
1	Qualified due to detected concentration in associated method blank sample.
2	Qualified due to detected concentration in associated trip blank sample.
3	Qualified due to integration nonconformances; bias cannot be determined.
4	Qualified as positively biased due to detected concentration in associated equipment rinsate blank sample.
5	Qualified as positively biased due to surrogate recoveries above the established acceptance limits.
6	Qualified as negatively biased due to surrogate recoveries below the established acceptance limits.
7	Qualified due to surrogate recoveries outside the established acceptance limits; bias cannot be determined.
8	Qualified as positively biased due to MS/MSD recoveries above the established acceptance limits.
9	Qualified as negatively biased due to MS/MSD recoveries below the established acceptance limits.
10	Qualified due to MS/MSD recoveries outside the established acceptance limits; bias cannot be determined.
11	Qualified as positively biased due to LCS recoveries above the established acceptance limits.
12	Qualified as negatively biased due to LCS recoveries below the established acceptance limits.
13	Qualified due to LCS recoveries outside the established acceptance limits; bias cannot be determined.
14*	Qualified as positively biased due to calibration nonconformances.
15*	Qualified as negatively biased due to calibration nonconformances.
16	Qualified due to calibration nonconformances; bias cannot be determined.
17	Qualified as negatively biased due to holding time nonconformances.
18	Qualified as negatively biased due to sample receipt nonconformances.
19	Qualified as positively biased due to sample receipt nonconformances.
20	Qualified due to sample receipt nonconformances; bias cannot be determined.
21	Qualified as positively biased due to other criteria (used twice, once for selenium and once for miscalculation).
22	Qualified as negatively biased due to other criteria (Not used).
23	Qualified due to other criteria; bias cannot be determined (Not used).
24	Qualified due to detected concentration in associated source water sample.
25	Reporting limit estimated due to low standard response.
26	Chromatogram did not match the diesel standard fingerprint pattern.
27	Retention time windows shifted during analysis.

DUP	= duplicate sample
J	= qualified as estimated
mg/kg	= milligrams per kilogram
mg/L	= milligrams per Liter
NC	= No Constituents detected above laboratory reporting limit or above background
µg/kg	= micrograms per kilogram
µg/L	= micrograms per Liter
*	= most commonly used qualifiers
MS/MSD	= matrix spike/matrix spike duplicate
LCS	= laboratory control samples



U.S. Army Corps
of Engineers
Engineering and
Support Center, Huntsville

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